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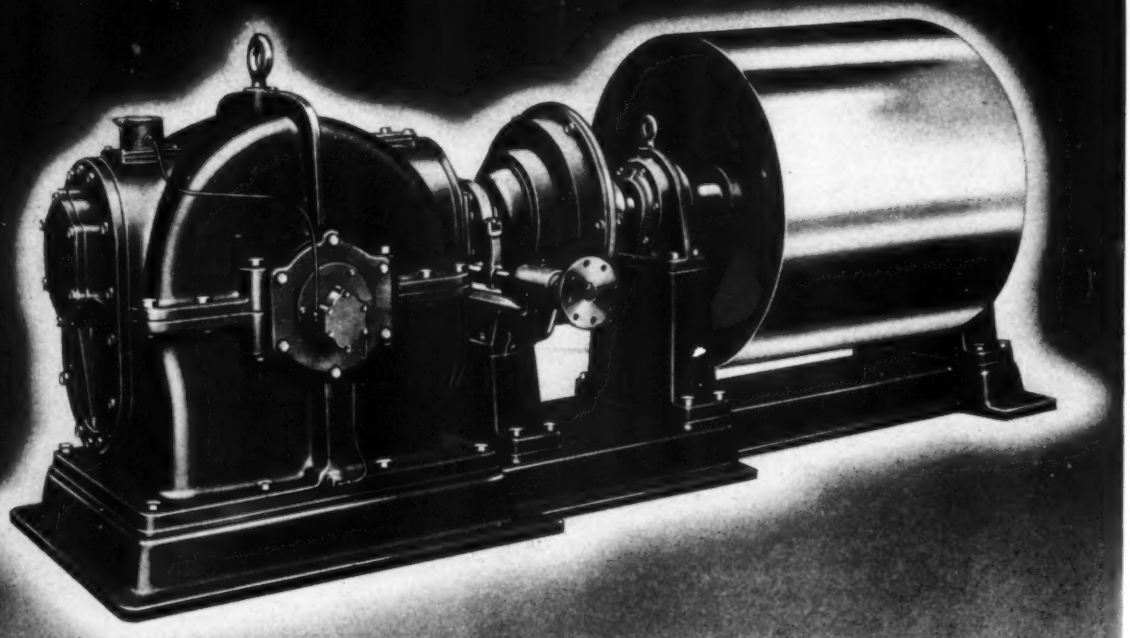
BAGLEY AND SEWALL

HYPOID GEAR DRIVES



THE SINGLE gear type of drives is built in both the spiral bevel or hypoid gear design. In either case, the driving gears are totally enclosed and operate in a continuous oil bath. These drives are fitted with a positive forced-feed oil pump, which assures an adequate supply to all points requiring lubrication.

The entire assembly is mounted on heavy duty anti-friction bearings.

These drives are supplied with clutches of the cut-off coupling type, or equipped with loose pulleys having the clutch mounted integrally with the pulley. Clutches may be either the magnetic or mechanical type as preferred.

These driving units are made in various sizes to operate with all power requirements of a paper machine.

Replacement of any old type drives by these modern methods of driving will definitely prove advantageous in your paper mill.

We will be glad to send you complete information on either type of drive.

THE BAGLEY AND SEWALL COMPANY - WATERTOWN, NEW YORK

TRADE WINDS

CHLORINE DIRECTIVE

▶▶▶ PULP AND PAPER manufacturers have been informed by the Office of Production Management, that because of the necessity to conserve the supply of chlorine for defense uses and essential civilian needs, each company is asked to comply with the following directive, which became effective September 22:

I. The following pulps shall be exempt from this directive:

a. High Alpha Pulps (not less than 90% Alpha Cellulose content)
b. Dissolving Pulps
c. Nitrating Pulps
d. Pulps in which chlorine is a processing rather than a bleaching chemical. Applications for such exemptions under subparagraph (d) shall be made to this Office and should be adequately documented.

II. No pulp or paper manufacturing company shall consume, on a quarterly basis, any more chlorine for the purpose of bleaching rag stock, than 80% of the average consumption during the six months ending July 31, 1941.

III. As determined either by the General Electric brightness tester or the tester developed by the Bureau of Standards, provided the latter is correlated, the brightness of the following pulps shall not exceed 76:

a. Bleached Sulphite
b. Bleached Sulphate

IV. As determined either by the General Electric brightness tester or the tester developed by the Bureau of Standards, provided the latter is correlated, the brightness of the following pulps shall not exceed 74:

a. Soda Pulp
b. Bleached Sulphate

conversion into bleached papers.

V. Until adequate brightness standards for paper are established, no pulp or paper manufacturer shall change the proportion of bleached, semi-bleached and unbleached pulps which presently obtains in the manufacture of any specific grade of paper, for the purpose of evading the restrictions on chlorine consumption effected by this directive, or to establish competitive advantages over manufacturers not enjoying adequate supplies of bleached pulps. No manufacturer shall increase the brightness of any paper beyond that now in effect.

VI. No pulp or paper manufacturing company shall consume on a quarterly basis any more chlorine in the manufacture of semi-bleached grades than 70% of the average use during the six months ending July 31, 1941.

VII. Pulp and Paper mills manufacturing their own chlorine supply shall so conduct their operations that the resulting effect on the pulps and papers manufactured shall be similar to that obtaining in other mills and so that no competitive advantage shall rest with the captive mills.

VIII. Exceptions to the above directive may be taken up with the Pulp and Paper Section of the Office of Production Management, and granted, if the evidence submitted proves unnecessary hardship. Such applications for exception should be fully documented.

IX. This directive makes inoperative the administrative suggestion of June 11, 1941.

◆

WASTEPAPER PRICES

A schedule of waste paper ceiling prices, took effect October 1, for all grades of waste paper sold in the area east of the Rocky Mountains. These prices were determined upon after an exhaustive investigation and after numerous conferences with representatives of all branches of the trade. They are in line with the prices prevailing on June 16, 1941. These prices, as emphasized by Leon Henderson, administrator of the OPA, are the maximum prices that consuming mills can pay their shippers at a point of shipment. Prices to be paid by wholesalers, brokers, and dealers, should be below these maximum prices.

The maximum prices per short ton established for all grades of waste paper f.o.b. point of shipment to mill, whether loaded on car, truck, or other means of conveyance are as follows:

Grades	*Maximum prices*
No. 1 Mixed Paper	$13.00
Super-Mixed Paper	14.00
No. 1 Baled News	15.00
Overissue News	17.00
Old Corrugated Containers	16.50
Old Kraft Corrugated Containers	27.00
New Corrugated Cuttings	18.00
Box Board Cuttings	14.50
White Blank News	33.00
Extra Manilas	37.00
New Manila Envelope Cuttings	54.00
No. 1 Hard White Shavings	50.00
Hard White Envelope Cuttings	60.00
No. 1 Soft White Shavings	43.00
Fly Leaf Shavings	33.50
No. 1 Heavy Books and Magazines	31.50
Mixed Books	20.50
Overissue Magazines	33.50
No. 1 Mixed Ledger (Colored Ledger)	38.50
No. 1 White Ledger	42.50
No. 1 Assorted Kraft (Old Kraft)	30.00
New 100% Kraft Cuttings	52.00
New 100% Kraft Corrugated Cuttings	49.00

◆

▶▶▶ IT IS CURRENTLY REPORTED that the St. Regis Paper Company, New York, is negotiating the sale of its Raymondville (New York) mill to the Johns-Manville Corporation. It is understood that, if the negotiations are completed, the mill, which has been producing newsprint, will be conditioned for the manufacture of pulpboard building products, and will employ 150 to 200 persons. The Johns-Manville Corporation has been leasing the Oswego plant of the St. Regis Company for the making of insulating board but this lease has expired.

INSTITUTE'S 1941 CLASS ON "BUSH COURSE"

The thirteenth class to enter the Institute of Paper Chemistry, is made up of 14 men who recently graduated from twelve different universities and colleges in the country. Their first activity consisted of a two-week period in the north woods, referred to as the "bush course."

The new students left Appleton on September 8 for an area west of Iron River, Michigan, where they studied the outdoor aspects of papermaking with headquarters at the University of Michigan Forestry Camp. This part of the course was given under the direction of Dr. I. H. Isenberg of the Institute staff, and Calvin G. Stewart of the Kimberly-Clark Corporation, wood technicians. The identification of pulpwood species, conservation work, economics as it applies to the industry, and logging operations were studied during this period.

◆

Just before the thirteenth class of the Institute of Paper Chemistry boarded the bus that took them a couple of hundred miles north of Appleton up into the pulpwood country on the seventh "bush trip" arranged by the Institute for its new students. The boys and their colleges (left to right):

Front row:
Melbourne Jackson, Montana State College
George Martin, Rice Institute
Arthur Haug, Marquette
Joseph Clark, U of South Carolina
Donald Hagerla, Iowa State College
Back row:
Walter Bublitz, University of Arizona
Hubert Privette, U of North Carolina
John Ireland, Ohio State University
John Appledoorn, U of North Carolina
Edgar Millegan, Montana State University
Robert March, DePauw
Gary Jones, Oberlin
Curtis Walseth, Iowa State College
Charles McAleer, Jr., Armour Col. of Engrg.
Gilbert Barnes, Institute Staff
Calvin Stewart, Kimberly-Clark Corp.
I. H. Isenberg, Institute staff
Andy Kangas, Bus driver—fourth trip

DETROIT PAPER PRODS. PLANT TO BE REHABILITATED

Idle for more than 10 years, the boxboard mill east of Kalamazoo, Michigan, built in 1909 by the Western Board and Paper Company and purchased in 1937 by the Detroit Paper Products Corporation, has been sold again, and by mid-November will be engaged in the manufacture of boxboard.

The mill was purchased late in August by Leon and William Slavin, proprietors of the Kalamazoo Paper Stock Company, for $300,000 following bankruptcy proceedings against the Detroit firm in federal court. Order confirming the sale under federal bankruptcy laws providing for reorganization was signed by Federal Judge Frank A. Pickard.

William Slavin said that he expected the mill would be in readiness in six to eight weeks, and also stated that production of board should run between 120 and 140 tons daily. Employment will be between 160 and 175 persons.

At least $125,000 will be spent by the Slavin brothers to recondition and rehabilitate the mill. Costly machinery, moved into the mill four years ago, but never uncrated, will be set up and some new machinery will be added. The mill has one large paper machine.

Western Board and Paper Company was organized in 1908, and started operations at the mill a year later. In 1925, the firm reorganized, and production soon reached a peak of 90 tons of board daily. From then on, production declined steadily until 1930, when the mill suspended operations.

For seven years the mill was not used. In 1937, the Detroit Paper Products Corporation purchased the premises with the intention of resuming manufacture of boxboard. Difficulties were encountered, however, and nothing was done in the plant although over $100,000 in new machinery was delivered.

In recent years, the Sutherland Paper Company, Kalamazoo, had used the mill as storage space.

◆

POWELL RIVER CO. COMPLETES NEW DAM ON LOIS R.

The new $1,000,000 Lois River Dam of the Powell River Company Ltd., Powell River, British Columbia, has been put in use. The old crib dam which served from the original development of the Powell River Company was recently dynamited.

The Stuart Cameron Contracting Company are completing the erection of the dam which is now on the same level as that of the old dam, but upon completion of the upper portion of the new structure, the level of the storage lake will be raised so that water will be backed up over the present railroad bed and many portions of the auto roads in the district, involving changing both the tracks and the roads.

◆

FINANCIAL

After a month in which securities worked steadily upward, the proposal on September 24 that no corporation be allowed to earn more than 6 per cent, the balance going in taxes, brought a sharp drop in security prices in which paper stocks suffered with other prices. Even with this drop, some prices were above those a month before.

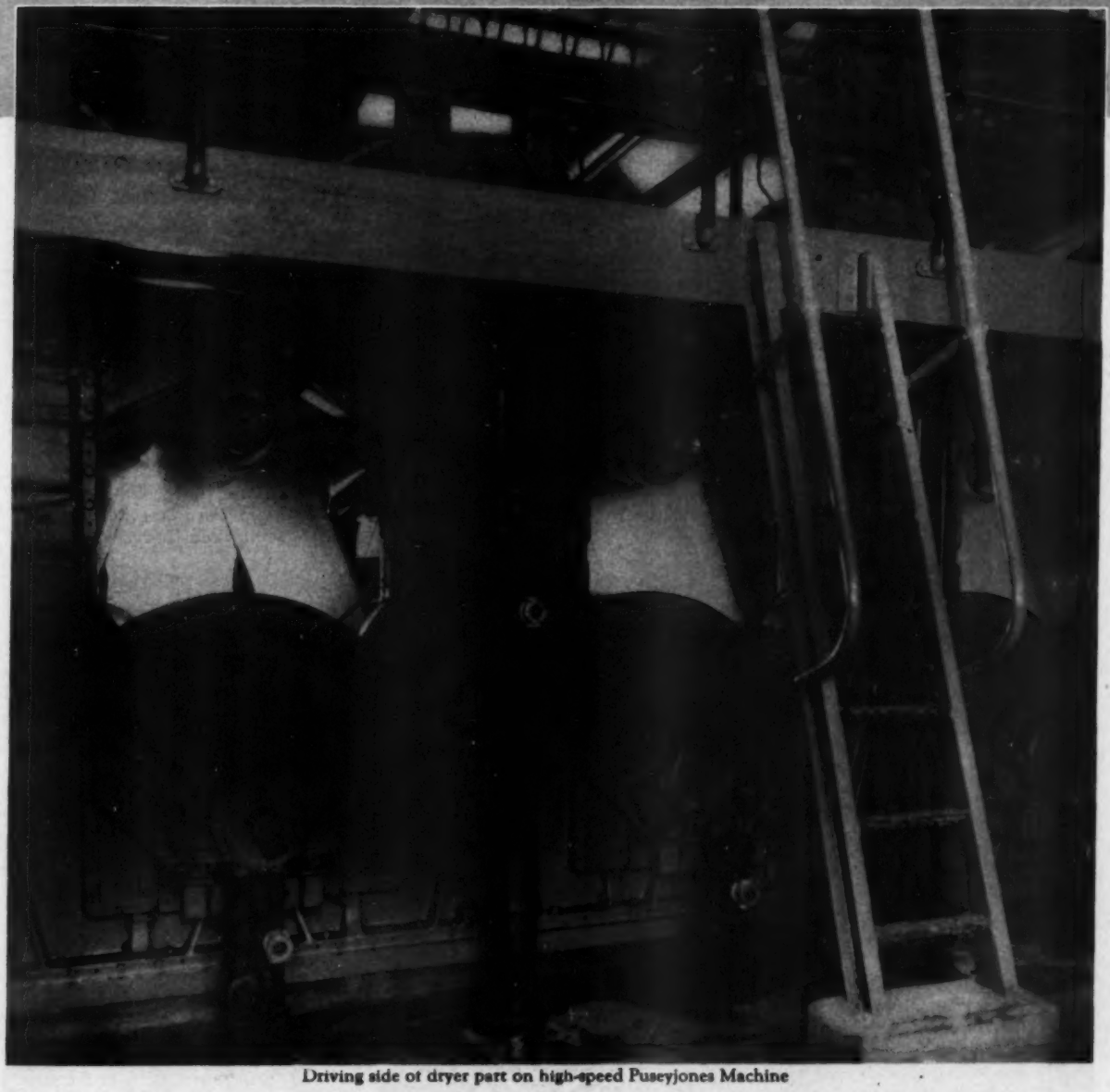
American Box Board Company—Profit for the first half year was $107,226.

American Writing Paper Corporation—Profits for the first half year were $136,780 as against $31,505 in 1940.

Brown Company—Net income for thirty-six weeks ending August 9 was $5,057,839 compared with $2,915,635 but of this amount about $1,300,000 will be required for taxes.

Celotex Corporation—Net earnings

An improved drive for dryer part . . . . .



Driving side of dryer part on high-speed Puseyjones Machine

The improved Puseyjones method for driving the dryer part has been used on high-speed paper machines for over ten years without a single shut-down due to drive trouble. On 12 of the latest newsprint and kraft machines built by Puseyjones, the improved Drive has insured *safe* operation and increased production.

Be sure that your next machine is equipped with the improved Puseyjones method for driving the dryer part, as well as other patented improvements that make Puseyjones the leader in the construction of paper-making machinery. Our engineers will gladly furnish full details about any improvement in paper-making.

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-making Machinery. Wilmington, Del.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

for nine months ending July 31 were $1,208,704 as against $305,458 a year ago.

Certain-Teed Products Corporation—Net profit for the six months ending June 30 was $518,721 as against $168,581 for the same period in 1940.

Continental-Diamond Fibre Company—Net profit for six months ending June 30 was $358,685 as against $220,070 for the same period in 1940.

Crown Zellerbach Corporation—Net profit for the quarter ending July 31 was $2,251,726 as against $2,244,315 for the same quarter in 1940.

Dixie-Vortex Company—Net profit for the fiscal year ending June 30 was $888,183 as against $825,007 in the previous year.

Escanaba Paper Company—Net profit for the six months ending June 30 was $111,416 as against $120,084 for the same quarter of the preceding year.

Robert Gair Company—A dividend of 30 cents per share has been declared on the preferred stock for the third quarter of the year.

Hummel Ross Fibre Corporation—Net income for twenty-four weeks to June 14 was $382,638 as against $319,616 for the same period in 1940.

International Paper Company—A dividend of $1.25 a share for the third quarter of 1941 on the cumulative convertible 5 per cent preferred stock.

Keyes Fibre Company—Bonds totaling $1,125,000 carrying 6 per cent are to be retired by an issue of $1,400,000 in 4½ per cent bonds, the amount remaining after calling the old bonds to be used for expansion.

Masonite Corporation—Net profits of $2,010,886.11, equal to $3.54 on each share of common stock, in the fiscal year ending August 31. Earnings for the fourth quarter of the fiscal year amounted to $830,800.66 an increase of 32 per cent over the corresponding period a year earlier.

National Container Corporation—Net profit for the first half of the year was $455,549 as against $477,872 for the same period in 1940.

Paraffine Companies—Net profits for the fiscal year ending June 30 were $1,600,038 as against $1,713,020 for the preceding year.

Rayonier, Incorporated—Net profit for the three months ending July 31 was $834,983 as against $1,085,552 for the same period in 1940.

Soundview Pulp Company—Net income for eight months ending August 31 was $1,260,361 as against $1,527,093 for the same period in 1940.

Tomahawk Kraft Paper Company—Net profit for the fiscal year ending May 31 was $269,929 as against $90,135 for the previous year.

United Paperboard Company—Net profit for the year to May 31 was $49,045 as against $22,559 for the same period in 1940.

West Virginia Pulp and Paper Corporation—Net profit for nine months ending July 31 was $3,382,624 as against $2,497,463 in the same period of 1940.

New York Stock Exchange—Stocks

	Closing Prices Sept. 25	Aug. 25
A. P. W. Paper Co...	*1⅜-1¾	*1⅜-1½
Celotex	8⅜	8¾
Same Preferred	72⅛	67⅝
Certain-Teed	3¼	3¾
Same Preferred	31	31
Champion P. & F. Co.	22	21½
Same Preferred	102	104¾
Container Corp.	14⅜	15
Cont. Diamond	9	9¼
Crown Zellerbach.....	13¼	13⅞
Same Preferred	90¾	87¾
Dixie Vortex	*7⅝-8	8⅜
Same "A"	*36 1/7-37	36
Robert Gair	2⅛	2⅛
Same Preferred	10¼	10⅛
Gaylord Container	11¼	11¼
Same Preferred	*50-52⅛	*50⅛-51⅛
Internat'nal P.&P. Co.	18¼	18½
Same Preferred	69⅜	69
MacAndrews & Forbes	*29⅜-30	*25½-26
Masonite	25¾	24
Mead Corp.	8	9
Same Preferred	*78-79	79¼
Paraffine Co.	*30-31⅜	31
Same Preferred	*103⅛-105	*100-105
Rayonier	13¾	15½
Same Preferred	27½	29
Scott Paper	39⅜	37¼
Same 4½% Pfd..	*112½-113⅜	113
Same 4% Pfd.....	*110⅛-111	110⅜
Sutherland Paper	19⅝	20⅛
Union Bag & Paper....	10⅝	11
U. S. Gypsum	57½	58¾
Same Preferred....	*172⅜-177½	178½

New York Stock Exchange—Bonds

Abitibi 5%	60½	55⅞
Celotex 4½%	97	96¾
Certain-Teed 5½%....	85½	86¼
Champion P.&F. Co. 5%	.....	107
Inter. P. & P. Co. 5%	104	104⅜
Same 6%	104⅞	105¼

New York Curb Exchange—Stocks

Am. Boxboard	*4½-5½	*5⅛-5½
Brown Co. Pfd.	22½	22
Great Northern	39	39½
Hummel Ross	5½	6¼
Nat. Container	10¼	10⅜
St. Regis	1⅞	2⅜
Taggart	3	2⅝
United Wall Paper....	1½	1¼

*Closing Bid and Asked Prices.

◆

FLAX FIBER SUPPLY BOOKED BY H. SMITH

A contract to supply Howard Smith Paper Mills, Montreal, with flax fiber to be used in the manufacture of cigarette papers and carbon papers was completed recently between that company and the L. R. Key Fibre Mills, Winnipeg. Negotiations were completed by G. Morazain, chemist for Howard Smith Company, who inspected a new machine especially designed by Mr. Key to decorticate Western Canadian flax straw. Mr. Morazain made an inspection tour of flax mills in the United States but found none equal to the machine designed by Mr. Key.

The signing of this contract is regarded as an important step, as it comes just when western Canada is seeking every means to decrease her dependence on wheat as the main cash crop. Both Mr. Key and J. M. Coughlan are gratified at the success so far attained, and the prospect which it opens for a profitable new industry for western Canada.

◆

WAUSAU PULP MILL OPEN—PAPER MILL REMAINS CLOSED

The pulp mill of the Wausau Paper Mills Company, Wausau, Wisconsin, has been re-opened following a layoff occasioned by floods over the Labor Day week end, which caused an estimated damage of $100,000.

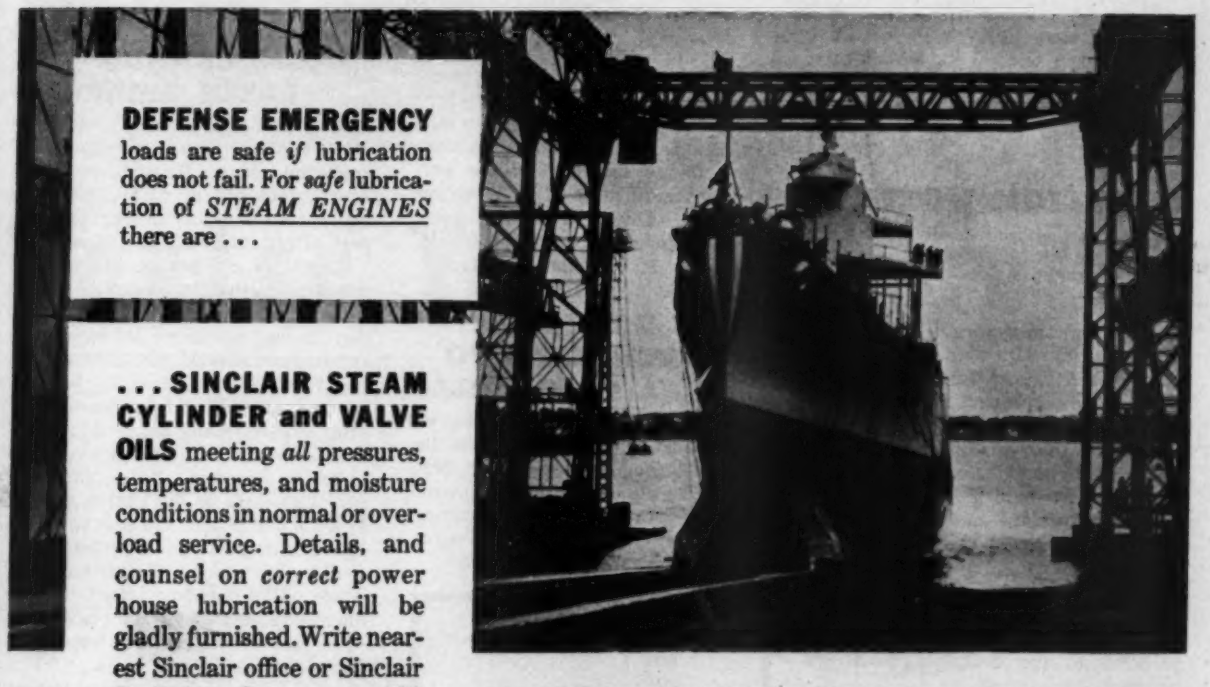
Harold C. Collins, president, announced that no plans had been made for putting the paper mill back in operation but the pulp mill will employ a full crew of 75 men. While the plant was closed, 400 workers remained idle. An emergency power setup is being used to operate the pulp mill.

◆

80 MICH. WORKERS RECEIVE HONORS IN VOC. COURSE

The State of Michigan supports an unusually fine and well organized body known as Trade and Industrial Education Division of the State Board of Control for Vocational Education. Under the supervision of this board, some outstanding work has been done in training pulp and paper mill workers. (Cf. THE PAPER INDUSTRY AND PAPER WORLD, Aug., 1940, p. 457.)

An interesting highlight on this work appeared in the September issue of *Michigan Vocational Outlook*. The item in question stated that 86 volumes of the textbooks *The Manufacture of Pulp and Paper* were awarded for perfect attendance and for a perfect grade in the final examination at the second annual banquet of the Port Huron (Mich.) Vocational Education Program for the pulp and paper industry. Hosts at this banquet which was held in the Black River Country Club, were Port Huron Sulphite and Paper Company and the Dunn Sulphite Paper Company. Eighty employees of these companies who were members of the vocational training classes were honored. F. W. Dalton, chief of the In-



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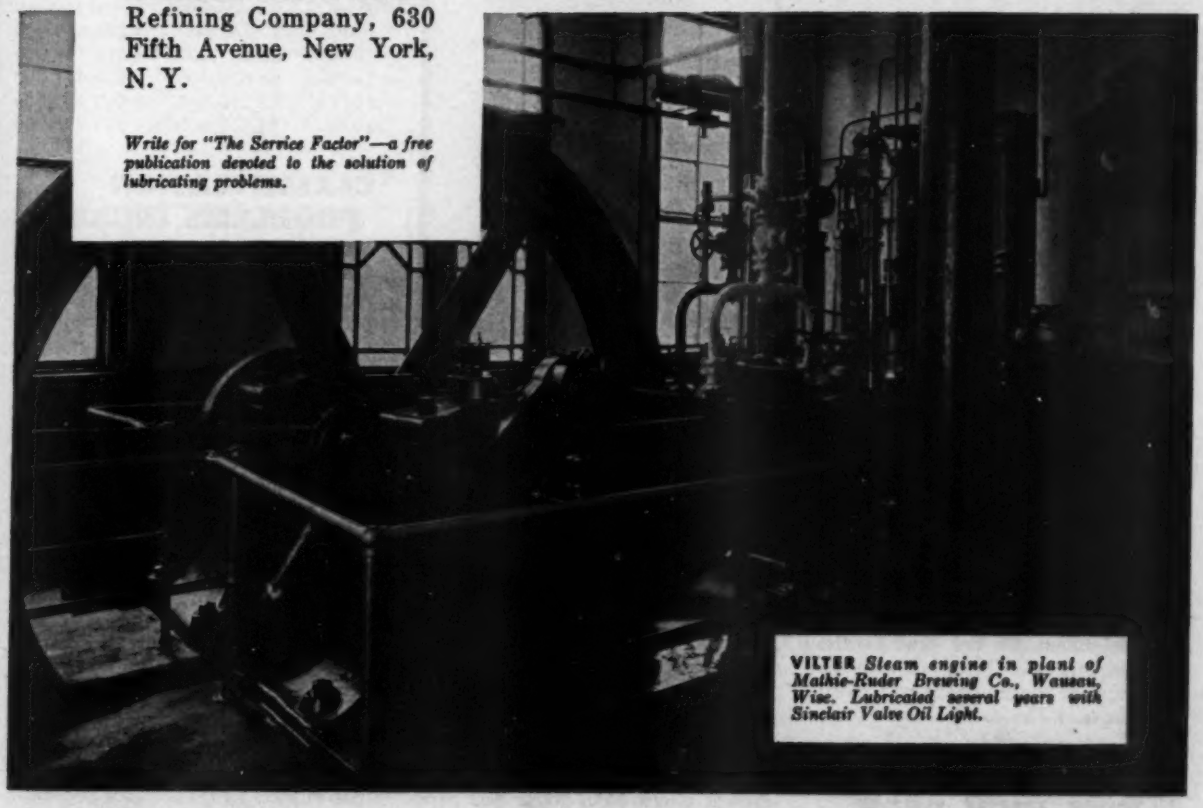

VILTER *Steam engine in plant of Mathie-Ruder Brewing Co., Wausau, Wisc. Lubricated several years with Sinclair Valve Oil Light.*

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dustrial Education Division of the State Board of Control for Vocational Education, was the guest speaker. Wilbur L. Cassiday is instructor of the course.

◆

FOREIGN NOTES

(The following items are taken from the *Foreign Commerce Weekly*, issued by the U. S. Department of Commerce.)

▶▶▶ Normally the bulk of Newfoundland's newsprint has been shipped to the United Kingdom, but recently the United States has been receiving the greater part of this production. During the first five months of this year the amount of newsprint imported from Newfoundland was 1/3 more than for the corresponding period of the previous year. Exports to the United Kingdom declined almost 50 per cent in the 1941 period against the corresponding months of 1940. Producers welcome this change, since they find it more profitable to receive payment in U. S. currency.

▶▶▶ Canada, with its pulp and paper industry operating at 90 per cent of capacity, produced 262,144 tons of newsprint, 68,428 tons of other paper, and 123,000 tons of raw pulp shipped in that form during 1940. These record production figures are expected to be equaled this year. The elimination of the Scandivanian competition, a strong domestic market, and increasing demand in the United States have encouraged expansion programs in the industry but the unpredictable future has discouraged starting any new companies in this field.

▶▶▶ There has been a sharp decrease in the amount of old and overissue newspapers being imported by China in the past 18 months. During 1940 China imported about 1/3 the amount that it did in 1939, and for the first four months of this year the amount has fallen below the corresponding period of the previous year. Until the end of 1939 the United States supplied about 85 per cent of the total imports into China, but with the beginning of the European war Japan took the lead.

◆

WATER STORAGE HITS HIGH PEAK IN WIS. VALLEY

Water in the reservoirs of the Wisconsin River Valley Improvement Company is at its second highest stage in a decade, assuring power to a number of Wisconsin valley paper mills until next spring. The extremely heavy rains, which caused half a million dollars property damage to mills in the Wausau and Merrill vicinities, brought water levels to their present high mark.

The stage for the week ending September 13 was reported at 10,206 million cubic feet, which is near the maximum storage reported for the outstanding year of 1938—10,879 million cubic feet. During 1933 the water storage dropped to a minimum for the decade of 1,890 million cubic feet.

◆

SCOTT PAPER CO. PURCHASES TWO I. P. CO. MILLS

The Scott Paper Company, Chester, Pennsylvania, purchased from the International Paper Company, on September 22, certain of this company's subsidiary plants and manufacturing facilities located at Marinette, Wisconsin, and Glens Falls, New York.

Raymond C. Mateer

The newly acquired mills will be operated as a separate organization through a subsidiary, the Marinette Paper Company, Marinette, Wisconsin. Raymond C. Mateer, vice president of the Scott Paper Company, has been elected president of the new company and will direct its operations.

The property at Marinette consists of a paper mill with four paper machines and finishing equipment, a sulphite pulp mill, a groundwood pulp mill, and a power plant. The buildings at Glens Falls house two paper machines and complete finishing equipment.

Primarily, these mills produce toilet tissue, facial cleaning tissue and paper towels. The annual sales for these products is estimated at $5,000,000. This purchase will enable the Scott Paper Company to meet the increasing demand for facial-type tissues.

PAPER EXPORTS FROM CANADA TO LATIN AMER. UP

The most recent records for 1940 show that the value of exports of newsprint from Canada to Latin America stepped up to $9,200,000, a figure far in excess of the previous peak of just under $5,000,000 in 1930.

Argentina led the list for the consumption of the Dominions newsprint by a substantial margin. Exports to that country amounted to $3,800,000 as compared with $1,600,000 to Brazil and $1,400,000 to Mexico. Seventy-five per cent of the total value of newsprint exports going to 19 South and Central American countries was represented by Argentina, Brazil, and Mexico. One-third of the total exports of $26,900,000 from Canada to Latin America in 1940 was newsprint.

The Dominion's Department of Trade and Commerce issued the following figure showing the place newsprint took in the country's exports to Latin America in past years.

Year	*Newsprint*	*Total Exports*
1940	$9,162,000	$26,869,000
1938	$2,427,000	$17,739,000
1937	$5,626,000	$24,451,000
1932	$2,256,000	$ 9,405,000
1929	$3,379,000	$43,677,000

◆

CLASSIFICATION PROBLEMS INCREASE

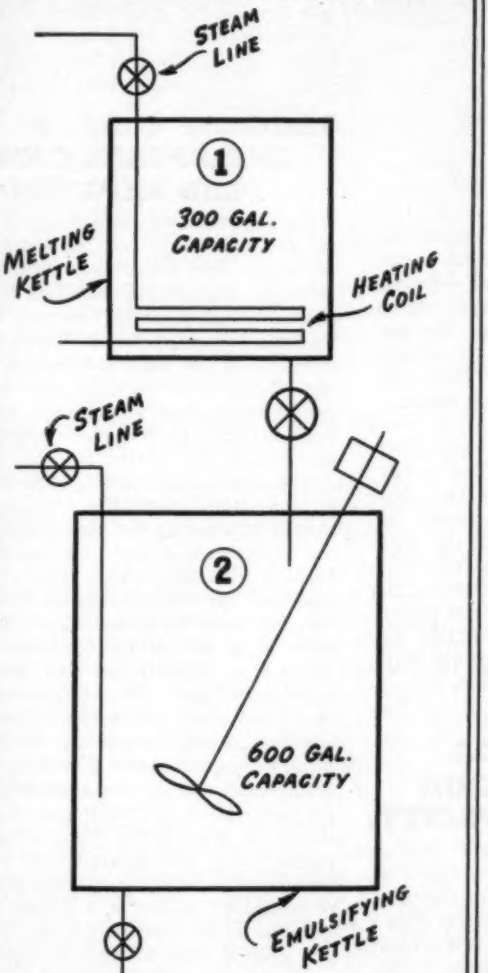
The search for substitute materials for the various standard grades of paper is resulting in an unusual number of inquiries as to the classification of various types of paper and paperboard being imported from Canada according to Warren B. Bullock, manager of the Import Committee of the American Paper Industry.

Reports from the committee state that the demand for corrugating material is so great that a substitute made of sulphite and groundwood is being imported from Canada in large quantities, and is being classified for duty at 30 per cent as paper not specially provided for. Another type of material is now being imported, in thicknesses over 12 points, which is probably admissible as paperboard 10 per cent. The weight of this material, if used for corrugating, is one-third higher than that of the thinner material imported for corrugating stock.

A Canadian shipment of paperboard is before the Customs officials for determination of its character, whether it is dutiable as vat lined board or at the lower rate of duty provided for test liner. The Import Committee has been asked to secure the assistance of domestic manufacturers in determining the classification of an imported

PAPER MILL PRODUCTION MANAGERS

Revise Your Budgets!



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MELT TOGETHER NOPCO 2251 AND PARAFFINE WAX IN IRON OR WOODEN TANK (1)

ADD TO EQUAL VOLUME OF HOT WATER—AND AGITATE (2)

EMULSION CONTAINING 50% EFFECTIVE SOLIDS NOW READY TO USE

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NEW NOPCO WAX EMULSIFIER

Mills Now Buying Over 15 Drums Wax Emulsion Monthly Can Save Even More!

For the first time mills using over 15 drums of wax emulsion per month can make their own emulsion—getting clear savings of $6 a drum.*

How is it done? Easy enough! New Nopco 2251 Emulsifier produces a stabilized emulsion *spontaneously*. No specialized equipment is necessary. Study the simple flow diagram of the emulsifying process.

Thorough tests and a year's experience of leading mills conclusively prove that Nopco 2251 produces a wax emulsion even superior to more expensive, ready-compounded types. It is a more efficient sizer as determined by Dry Indicator Tests, Cobb Size Tester, Penescope and Immersion Tests. It works equally well in all types of furnishes. In fact, 2 pounds of this wax size is equal to the sizing value of 3 or more pounds of rosin size (all figures on dry basis).

Wax Emulsions prepared with Nopco 2251 Emulsifier are equally effective in the beater or for surface use.

Without obligation, write for free booklet which gives complete information not only on Nopco 2251 itself but also on how to use it with various types of papers and boards.

National Oil Products Company
Harrison, New Jersey

Without obligation, please send me new free booklet describing Nopco 2251 Wax Emulsifier in detail.

Name .....

Company .....

Address .....

* Note—
Mills using less than 15 drums of wax emulsion per month may prefer to use Nopco 2252 or Nopco 2252-C—prepared emulsions ready to use.

mill wrapper. Customs officials have also asked the Import Committee for information as to the classification of certain fine threads of twisted paper, in an effort to determine whether this material is known as yarn. It is the component material of Japanese decorated hand bags.

Canadian products for building purposes have come before the Customs officials for consideration. Although the United States Customs Court has held that asphalted duplex kraft paper is dutiable at the rate for kraft wrapping paper, a new attempt is being made by the Canadian producers to have the paper admitted at the 10 per cent rate provided for building paper. Laminated wallboard from Finland classified at 30 per cent but claimed to be dutiable at 10 per cent was held by the United States Court in a recent decision to be dutiable at the higher rate.

◆

TIMBER PRICE FIXING AFFECTS CAN. PAPER COS.

Many of the large pulp and paper companies in Canada are also large producers of lumber and they are affected by three new orders issued by the federal Timber Controller setting maximum dealers' prices for various kinds of lumber and shingles.

The orders establish maximum prices for: (1) hard maple, basswood and soft elm, excluding swamp elm, sold anywhere in Canada; (2) white cedar shingles sold in Ontario, Northern Ontario, Quebec, New Brunswick, and Nova Scotia districts and Prince Edward Island, and; (3) spruce lumber delivered at any place in New Brunswick or Nova Scotia. The maximum prices are fixed at recent market levels and the orders are part of a program to prevent inflation.

◆

NEW .009 SULPHITE CORRUGATING PAPER

Five or six major Canadian newsprint companies are now manufacturing for the United States market a new product known as nine-point sulphite corrugating paper. They are making about five to six thousand tons a week, and have contracts extending to the end of the year. The new paper is being sold at about $60 a ton, U. S. funds, delivered in New York, plus customs and charges.

The new product is being made on standard newsprint machines, in much the same way as newsprint paper, but has a much higher sulphite pulp content, and is stronger and heavier. While the regular news sheet contains about 12 per cent sulphite and 88 per cent groundwood, the special sheet runs as high as 33 1/3 per cent sulphite. It is artificially colored to give it the appearance of kraft and is being used as a substitute for that product, it is also processed in the same way by the boxboard manufacturers.

◆

QUESTION DUTY ON GROUNDWOOD PRINTING PAPER

Sheet newsprint exported from Canada and imported into Puerto Rico is being admitted duty free because the sheets are 20 x 30 which is the standard newsprint size, according to the Import Committee of the American Paper Industry.

The question of duty on groundwood printing paper, which is lightly washed on one side with clay, has been brought up by representative manufacturers who say that this paper is dutiable as groundwood printing paper and not as a coated paper. Actually the paper is coated, but the coating is so light as to be almost imperceptible, and is far from the type described in the paper industry as coated paper.

Several cases which were scheduled for trial at Minneapolis for last month involve the claim by importers that the weight of newsprint found by Customs chemists was not the true weight of the paper as imported. This problem, involving the determination of the true weight of newsprint papers which may have gained weight by moisture absorption, has not yet been decided by Customs officials.

◆

EXPANSION WILL INCREASE UNION BAG CAPACITY

Expenditure of $4,500,000 during the next 12 months on an expansion program at the Savannah, Georgia, plant, has been announced by Alexander Calder, president of the Union Bag and Paper Corporation. The plans call for the installation of a 234-inch paper machine, supplementing the four now in operation there.

The company has been given preference ratings for deliveries of materials necessary for construction purposes because this company is supplying a large volume of pulp, bags, and containers essential to the national defense program, and also because the increased output of kraft pulp will help to overcome a growing shortage in this product.

Other installations call for a new turbine of 7,500 kw., a new 300,000 lb. per hour steam boiler; two recovery furnaces of 175 tons each; a new office building; the construction of an additional floor to the bag factory, 500 by 200 feet in size; and the construction of an addition to the bag factory 100 by 150 feet.

The Savannah plant, constructed in 1937 at a cost of more than $7,000,000, was one of the first constructed in the South for the manufacture of kraft paper and pulp from southern pine.

Mr. Calder announced that the construction and installation of equipment will increase the daily capacity of the mill from 692 tons of kraft board, paper, and bags daily to 1,000 tons.

◆

TAGGART CORP. & CHESAPEAKE-CAMP PLAN EXPANSION

An expansion program designed to aid in meeting defense requirements for heavy duty paper bags used for industrial shipments of chemicals, food products, and building materials has been announced by Roy K. Ferguson, president of the Taggart Corporation, New York City. The program calls for the construction of a modern, fully equipped factory for manufacturing heavy duty kraft paper bags.

The new plant, which will cost approximately $500,000, will be located adjacent to the paper mills of the Chesapeake-Camp Corporation, Franklin, Virginia. This latter company will spend approximately $700,000 for equipment to manufacture kraft paper which will be used by Taggart to manufacture the heavy duty paper bags. The daily out-put of the new plant will be 250,000 bags.

Plans and specifications for the new plant are completed and approved and arrangements for the special machinery are being made so that it can be installed as soon as the plant is completed. The Chesapeake-Camp Corporation is scheduling its installation of equipment so that it will have the specified kraft ready when the Taggart plant is ready to begin operations.

◆

PORT MELLON MILL ACQUIRED BY SORG

The Port Mellon pulp mill, British Columbia, which has a capacity of 65 tons of unbleached sulphate pulp daily, was purchased September 9 by the Sorg Paper Company, Middletown, Ohio, from the Vancouver Kraft Corporation. Prior to the completion of the negotiations, the Sorg Paper Company was purchasing the entire production of unbleached sulphate pulp in accordance with the terms of

THE
CHEMIPULPER
combining the
ASPLUND DEFIBRATOR
and
B-K REACTION CHAMBER
(Patented and Patents Pending)

For the continuous production of

SEMI-CHEMICAL PULPS

from

WOOD, STRAW, BAGASSE, AND OTHER CELLULOSIC MATERIAL

Suitable for the manufacture of dry felts, .009 board, and filler fibre for various grades of paper and paper boards; also fibre for plastics and many other products.

The Chemipulper process is a combination of continuus cooking under controlled conditions of time, pressure, temperature and chemical treatment plus controlled refining under pressure. The quality and yield of fibre can be controlled to meet specific requirements.

The chemical treatment can be either alkali, acid, or neutral.

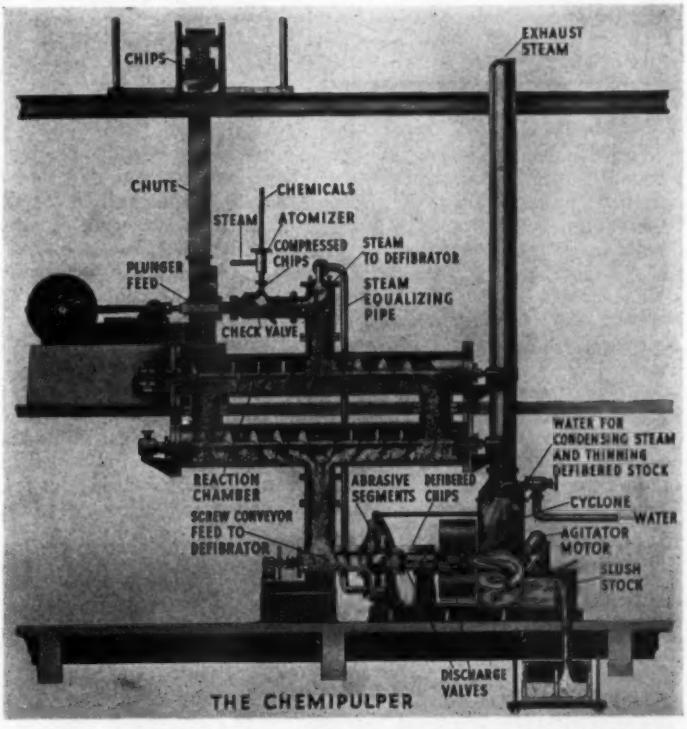
Hard and soft woods, straw, bagasse, and other cellulosic materials can be converted economically into usable fibre.

The Reaction Chamber is made in sections and the number of these can be varied according to the degree of treatment required. The equipment is constructed so that 200 pounds steam pressure can be used. The screw conveyors insure uniform treatment and flow through the Reaction Chamber.

The Chemipulper will produce a free fibre for manufacture of wall board, insulating board, and roofing and flooring felts, and a hydratable fibre for .009 corrugating purposes, and as a filler for various grades of paper and paper board.

Low steam, power, and chemical cost.

New descriptive Bulletin mailed upon request.



Flofoto of Chemipulper. Conveyors mix and move the chips (while chemicals are introduced) toward the disc refiner, where mechanical action takes place before the pulp is discharged through the discharge valves. The discharge valves release the pulp at approximately 50% consistency after the combined thermal, chemical and mechanical treatment. The 50% consistency pulp is diluted in the mixing chamber of cyclone to desired consistency on its way to the chest.

PAPER and INDUSTRIAL APPLIANCES
Incorporated
122 East 42nd Street, New York, N. Y.

the purchase contract entered into in November of 1940, which stated that the entire production of this mill for a period of two years would be sold to the Sorg Company, and also this company had the option of buying the mill at any time during this period.

An extensive expansion program is being planned by the Sorg Company and it is expected that with the planned changes the out-put of the mill will be doubled. Plans are also being made for the production of bleached and unbleached sulphite and bleached sulphate as well as unbleached sulphate, but this program will be delayed until the production of unbleached kraft pulp has been doubled.

This expansion and improvement program being carried out by Sorg contemplate the production of the highest possible grades of the various types of pulp to be manufactured on a most efficient operating basis.

◆

"DEFENSE REPORTER" ON AIR AT CAMAS

With the drone of bag machines as a sound background, the story of the operation of the Crown Willamette Paper Company mill, Camas, Washington, a division of Crown-Zellerbach Corporation, was broadcast over a 90-station hookup and re-broadcast by short wave to Europe and South America on the evening of September 13.

The program "Defense of America," sponsored by the National Association of Manufacturers, was one in a series of weekly broadcasts on private industry's part in national defense. The program featured the pulp, paper, lumber, and plywood industries in the State of Washington.

Resident manager J. E. Hanny, Machine Tender Clyde Johnson, who is also president of the Pacific Coast Pulp and Paper Mill Workers Association, and Mrs. Florence Ball, one of the Camas mill's three grandmothers, who operates a machine that makes powder bags for defense purposes, spoke on the program. They explained briefly the steps in papermaking and the operation of the bag machine.

At Snoqualmie Falls, Washington, Graham McNamee, NBC announcer, described the falling of a huge fir tree, and the operation of a Weyerhaeuser lumber mill. At Hoquiam, Washington, a plywood factory was described.

◆

FINCH, PRUYN CO. TO INSTALL NEW ELECTRIC MOTOR

A 2,500-hp. electric motor to be used as an auxiliary means of operating one of the five pairs of grinders in the newsprint mill during periods of low water will be installed at the Finch, Pruyn and Company, Inc., Glens Falls, New York.

Maurice Hoopes, president of the company, who announced the plans for the motor installation, also stated that the supply of pulp wood floated down the river each year from the interior of the Adirondacks, where the company has huge timber holdings, has been severely retarded by low water.

Approximately 60 per cent of the total season's cutting for this fall is at points in the river considered within reach of the plant. Most of this pulp wood is floating in the river below Spier Falls and generally reaches the mill by the latter part of June. The remaining 40 per cent of the wood is north of Luzerne, New York.

It was also announced that the grinders would be arranged so that they may be operated by electric motor or by water power, which has been used in the past. The necessity of installing such an auxiliary unit has become increasingly apparent this season because of the low condition of the Hudson River.

◆

PABCO PLANS FOR POST-WAR PERIOD

A concentrated effort is being made by the Paraffine Companies, Inc., San Francisco, to stabilize and extend industrial prosperity into the years following the present emergency. W. H. Lowe, president of the company, states that, "The nation's industries must cast a horoscope for the future, if the United States is to avert an industrial depression of unemployment and low wages."

Mr. Lowe also warned that industry should not be looked upon as a magician, and that a slump in industrial production is inevitable unless we observe a few fundamental principles of industrial initiative and free enterprise in planning to compensate for the slack which will come when the defense boom ends.

The plan which this company is carrying out to support these contentions can be divided into three parts. *First*, money is being invested in surveys of the entire manufacturing industry to find new products suitable to Pabco manufacture. Methods of improving present lines still further and supplying of new materials to replace those needed for defense, are questions being carefully considered; *second*, research men are working on the problem of converting numerous waste products into useful manufactured articles to be put on the market after the war is over when defense production is stopped; and *third*, advertising, merchandising, and public wants are being studied to ascertain trends in the future buying demand.

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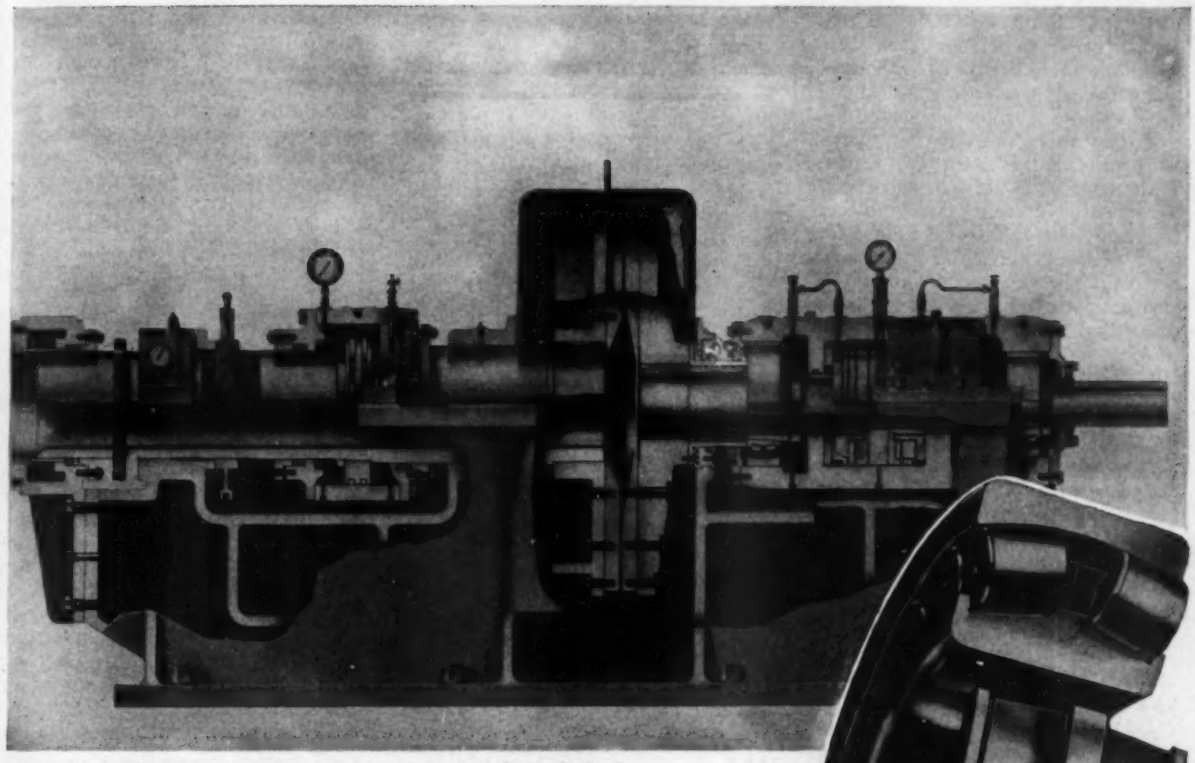
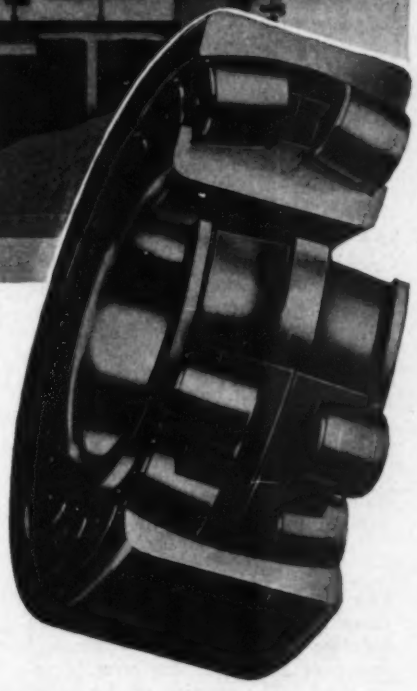
▸▸▸ FOLLOWING an announcement that the Brookville (Indiana) mill of Hinde and Dauch had been sold (Cf. THE PAPER INDUSTRY AND PAPER WORLD, Sept., 1941, p. 536), it is now learned that this mill was taken over by The Williams Felt & Paper Company, and that the mill is now being put in shape and additional machinery installed.

A scene from the "Defense of America" broadcast from the bag factory of Crown-Willamette Paper Company, Camas, Washington. Left to right: John Pearson, producer; Maitland Jordan, announcer; Resident Manager J. E. Hanny; Clyde Johnson, machine tender; and Mrs. Florence Ball, a grandmother, who operates a machine that makes powder bags for defense purposes.



The Sutherland Refiner is designed, sold and serviced by Sutherland Refiner Corporation, Trenton, New Jersey. Valley Iron Works Company, Appleton, Wisconsin, is the licensed builder in the United States. The advantages of the Sutherland in quality, capacity and low power consumption are recognized by leading paper manufacturers at home and abroad.



Wherever it goes

SO DOES SKF SERVICE

Sutherland engineers had more than one good reason for selecting SKF Spherical Roller Bearings for this Refiner. They obtain rugged bearings that maintain their high capacity while aligning themselves according to drive shaft deflections, distortions or weave. In addition, they can ship this refiner to any paper-making country in the world, safe in the knowledge that the bearings will be serviced by SKF. There's an SKF office in every civilized country on the globe.

SKF INDUSTRIES, INC., PHILA., PA.

4092

ROLLER SKF BEARINGS

ADVERTISING PAGES REMOVED

BRIEFS

▶▶▶ AN INNOVATION in the field of personnel relations took place when Mrs. Vera Berney was appointed to do special personnel work among the 400 women employees in the Pacific coast paper mills of the Crown Willamette Paper Company, Camas, Washington. An official stated that the growth of employment in the Camas division has created a need for more personnel service and the situation could be best met by placing a woman in the office to serve women employees.

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▶▶▶ DUE TO THE SHORTAGE of newsprint in the Netherlands an order has been issued, whereby about 50 newspapers and some hundreds of periodicals must cease publication, and the larger newspapers will be restricted in the number of pages. A report states that a special fund has been set aside to take care of those workers losing their jobs by this conservation measure.

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▶▶▶ ALL EMPLOYEES of the Crown Willamette Paper Company, Camas, Washington, who have been drafted into the army or who have volunteered for service, are receiving a complimentary subscription of the local newspaper, *The Post-Record*. This plan is being carried out by the Crown Willamette Company in co-operation with the newspaper. It was announced that many letters of appreciation have been received from the boys in camp.

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▶▶▶ A LARGE ADDITION to the Chandler, Quebec, mill of the Gaspesia Sulphite Company, Ltd., which will cost over $400,000, was recently announced. The erection of the building will be carried out by the company's own men and will be placed under way immediately.

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▶▶▶ GROSS PRODUCTION VALUE of the Canadian pulp and paper industry reached a new high in 1940, when it was valued at $298,034,843, according to the annual review by the Dominion Bureau of Statistics. 1940 production was valued at $243,970,961, 22 per cent higher than the peak in 1929. Production in 1939 was valued at $208,152,295. 81.1 per cent of the total tonnage in 1940 was newsprint. Newsprint produced amounted to 3,503,801 tons, valued at $158,447,311 as compared to 2,926,597 tons valued at $120,858,583 in 1939, an increase of 19.7 per cent in tonnage and 31.1 in value.

▶▶▶ AN INCREASED DEMAND for roofing and paper products has caused the Sidney Roofing and Paper Company, Ltd., to undertake an expansion program involving additions to its main plant at Victoria, British Columbia. A new building, 250 feet in length, is being constructed, which when completed will house a paper machine capable of producing 30 tons of paper products and roofing felt per day. The machine was purchased some time ago, and is expected to be in operation about January, 1942.

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▶▶▶ PAPER DRINKING CUPS will be made by Universal Paper Products, Ltd., Toronto, Ontario, a new Canadian subsidiary of a Chicago firm of the same name. Walter J. Hamlin, president of the parent company, will also act as president of the Canadian organization.

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▶▶▶ ALTHOUGH MANY UNITED STATES MILLS have advanced the prices of newsprint for 1941 to narrow the gap between American and Canadian prices, the Canadian mills have decided to make no change in the existing price base of $50.

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▶▶▶ THE JAMES MACLAREN COMPANY, Ltd., Buckingham, Quebec, has approved plans for an extensive expansion and improvement program at its mill, including several new one and multi-story buildings, to be equipped for increased capacity, construction of two new dams for mill service, and miscellaneous work. The entire project is estimated to cost over $1,500,000 with equipment. Construction will begin immediately.

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▶▶▶ THE SAME PRICES prevailing under voluntary agreement for several months on all grades of paperboard east of the Rocky Mountains, became ceiling prices October 1, by order of Leon Henderson, administrator of the OPM. (Cf. P. I. & P. W., Sept. 1941, p. 616.)

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▶▶▶ PLANS ARE COMPLETED for an addition to the Canadian Wire Bound Boxes, Ltd., Toronto, Canada, which will involve the construction of a new building and equipping it for increased production. The program will cost approximately $70,000.

▶▶▶ AN INCREASE of 17.7 per cent in freight car loadings of paper, paperboard, and prepared roofing during the last quarter of the current year over the corresponding period a year ago is forecast on the basis of estimates compiled by 13 regional Shippers' Advisory Boards. These estimates indicate that such car loadings will reach a total of 118,761 during this year's final quarter, compared with a total of 100,875 in the fourth quarter of 1940.

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▶▶▶ APPROPRIATIONS FOR EXPANSION were made under special authority of the Canadian Government in recognition of the importance of the paper and pulp industry in wartime economy. The British Columbia Pulp and Paper Company, Vancouver, British Columbia, will carry out an expansion program in the company's two mills—Port Alice and Wodfibre, British Columbia—involving an expenditure of $750,000. Under similar conditions, the Powell River Company, British Columbia, was permitted to proceed with expenditure of $980,000 on an extension to its unbleached sulphite plant.

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▶▶▶ CHLORINE AND CORK will go under government control soon it was announced by W. E. Uren, executive assistant to the Director-General of Priorities in the Department of Munitions and Supply, in his address at the annual convention of the Canadian Purchasing Agents recently held in Montreal. He also stated that the curtailment announcements would both come from Ottawa and that the order affecting chlorine would be designed to cut down consumption by the paper industry.

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▶▶▶ THE STERLING PULP & PAPER COMPANY, Eau Claire, Wisconsin, has been named as the source of supply for the $79,904 contract for target paper awarded Bradner Smith & Company, Chicago, by the war department.

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▶▶▶ BUILDING PERMITS have been granted to the Hammermill Paper Company, Erie, Pennsylvania, to the extent of $63,591 in machinery replacements. A total of $34,000 will be used to replace equipment in the boiler house, $17,591 is allotted for making changes in the arrangement of the office building, and $12,000 will be used to make room for new equipment in the economizer building.

Editorial

It's Up to Us!

▸▸▸ THE PAPER INDUSTRY has done a good job so far in handling its problem of furnishing paper for the defense program and also supplying the tremendous expansion of civilian demand.

Particularly is it to be commended for the pricing of its products in view of the fact that its pulp production is practically static, while the demand for consumption has increased tremendously. During the week of September 15, Norbert A. McKenna, chief of the Pulp and Paper Section of the OPM, addressed an open industry meeting of the National Paper Trade Convention, at the Stevens Hotel, Chicago. As a part of this address, Mr. McKenna stated that the industry has the opportunity to regulate itself and thus avoid going under priority rule as the steel, aluminum, brass, copper and other essential industries now are. He pointed out the fact that the paper industry is about the only large tonnage industry not under priority rule, and if it will now co-operate with the OPM in developing ways and means to supply the Government, Army, Navy and Lease-Lend with its material products to fill defense orders, it will escape priority rule which will be very much to its credit and most of all to its advantage.

He stated further that the OPM seeks the co-operation of the industry as a means to prevent governmental interference with its operation, but said that the industry must close the gap between supply and demand; that a shortage estimated to be between five and six million tons of paper yawned ahead for 1942.

Specifically, he pointed out that we are faced with a 1942 over-all demand for normal civilian and direct and indirect defense demands of about twenty-six million tons of paper with a supply of about twenty-one million tons. He asked for committees from each division of the industry to advise with the Pulp and Paper Chief and to aid in solving the immense imminent problems. The appeal was definite, direct and winning.

Certainly, the paper industry will co-operate. It must co-operate for its own future safety. It constitutes the biggest and most momentous challenge ever presented to the industry. One feature of the situation, which makes for hesitation, is the confusion existing in the minds of most executives concerning how the priority system works.

The reason, therefore, is plain—there is a lack of study among the mills of the priorities and their application. What each paper mill executive should do at once is to appoint some member or members of his staff to handle priority matters. This point was covered in a bulletin issued by Mr. Stettinius August 12, 1941. Mr. Stettinius said:

> "As the defense program continues and as shortages increase, manufacturers and producers will find themselves faced with an increasing number of procedure problems. The solution of these problems may be expedited if some member, or members, of the staff are assigned specifically to the handling of priority problems and procedure. If this is done, the manufacturing plant will always have available competent advice within its own organization on how priority problems may be handled."

Priorities are the key to the whole question of successful operations under present conditions. Plants must know how to obtain priorities in order to get supplies into the mill, and also how to obtain those high preference rated orders for their outgoing products.

Simply because the paper industry is fortunate enough not to be under priority control, as the steel and other essential industries are, does not exempt it from its primary obligation to give preference to all requisitions for paper products necessary to complete defense orders. Herein lies the paper industry's outstanding responsibility to service our country's all-out defense, and the extent to which the paper industry recognizes and intelligently discharges this responsibility will determine whether or not the industry may continue to operate without priority control.

It's up to us!

Research--More Of It

▸▸▸ RIGHT NOW THE PULP AND paper mills of the country are operating under peak conditions such as they never experienced before in their history. Only a few short years ago, much was said and written about profitless prosperity in the industry. At that time, mills were running but at considerably lower operating ratios than today and paper prices did not permit so many of them to make a profit commensurate with individual investments. Conditions generally within the industry at that time were not what they should have been; in fact, it is doubtful if they had been at any time previously since 1921.

Paper requirements, however, have continued to increase, the per capita consumption rising from 122 lb. in 1921 to 252 lb. in 1940. Even with this tremendous increase in consumption, expansion of the industry took place at such a rate that paper mills continually found themselves facing a buyers market.

The situation today because of the defense program presents quite a different picture. Paper prices are good and the demands for paper are greater than the capacity of the industry to produce. To make up for the deficit is a problem of both management and technology. Management may find it possible to expand productive capacity; technology may be able to alter processes and products so that existing capacity will be better able to cope with market demands. Together, management and technology can be counted upon to find a way to supply paper in sufficient quantity to meet the immediate market requirements of the nation.

A recent news release of the National Association of Manufacturers looks ahead to the future and presents tangible evidence of industry's faith in America's future. The evidence is that manufacturing industry throughout the nation will spend $117,490,000 for research this year. The percentage ratio of research expenditures to gross sales of the firms making up this total figure ranged from two-tenths of one per cent to three per cent, the companies in the chemical industry having a ratio of 2.4 per cent.

The study to obtain these data was conducted by Dr. Karl T. Compton, president, Massachusetts Institute of Technology and chairman of the Association's Research Advisory Committee.

Just what is the research expenditure of your mill as a per cent of gross sales? Is it high enough to satisfy you that your organization is giving sufficient thought to the possible development of new grades of paper, to the development of new uses for paper, to the possibility of a more efficient manufacturing technique or does it indicate that your mill is satisfied to ride along on the crest of an unnatural wave of prosperity?

ADVERTISING PAGES REMOVED

. . . CURRENT THOUGHT . . .

BUCKLE DOWN . . . SUMMER'S OVER

WILLIAM SIBLEY

ADVERTISING

▸▸▸ SPEAKING BEFORE A GROUP of Purchasing Agents on the subject of current business conditions and the possibility of there remaining, for some time, a "seller's market," Dr. J. Anton de Haas, of the Graduate School of Business Administration, Harvard University, said: "In the face of this shrinking market, it would be well for manufacturers to examine their advertising budgets. Any attempt to stimulate civilian consumption through advertising at this time would seem futile, and if not futile, contrary to the national interest." . . . If the genial Doctor will permit, I should like to take a thousand per cent objection to his conclusion. This may be the time to stop advertising waste, but it is certainly not the time to stop advertising. This is certainly the time to be careful of what you say and how you say it, but this is certainly not the time to quit talking. This certainly is the time to re-examine and possibly realign advertising budgets, but it certainly is not the time to abandon them. What the good Doctor fails to appreciate, apparently, is the fact that advertising can do many things besides stimulate buying or command orders. The functions of advertising are legion. Some of them are: The creation of the desire to buy; the building of good will for the manufacturer's institution; the holding together of a long line of distributors and jobbers; the education of the buying public to the manufacturer's problem; the privately sponsored aid to the Government; and the encouragement of national patriotism.

However, probably the fallacious reasoning of the good Doctor is in part due to the way advertising as a whole is run by those who comprise the advertising fraternity. All advertising men, or staff members of advertising agencies, are not white-winged angels, or commercial seers. Some of them are square pegs in round holes; some of them are round pegs in square holes; only a portion of them fit. The same thing might be said of any division of industry, however. Some people say advertising is wasteful—and some of it is. Some people say that advertising is flippant—and some of it is. Some people say that advertising exaggerates—and some of it does. Some people say advertising makes people want things they could get along without—and perhaps some of it does.

There is another side to this public activity, however. There are some participants in the field of advertising who do a splendid, conservative, sincere job. Let me tell you of one. His is a voice that many throughout the nation hear and respect. His voice is regularly heard over the Columbia Broadcasting System. He speaks calmly even though some news commentators shatter the air with excitement. He speaks plainly and simply, that all may know what he means. He speaks with kindliness and toleration, even when he disagrees. It seems significant that he speaks as a representative of an American business, on paid advertising time. That business is another significant thing, for it is very large, employing thousands of people on its own payroll and indirectly making work for many thousands more, yet it has grown up in one man's lifetime—from an idea that was largely scorned at first. Ladies and gentlemen, I commend to you Mr. W. J. Cameron, the voice of Ford's Sunday Evening Hour.

THE THREE BARES

▸▸▸ *"All mankind is engaged in three activities: Emptying what is filled; filling what is empty; and scratching where it itches."*

Frankly I don't know who first said that. . . . But the more you think of it the more its truth will impress you.

Breathes there a man with skin so dead who hasn't had an itchy back? We probably would be astounded if some research-minded statistician would tell us the amount of time consumed in scratching the itchy anatomies of this nation's 130 million inhabitants. Doubtless it ranks, in importance, with daylight saving.

As for "emptying what is filled and filling what is empty," everyone is doing that unceasingly. Mother used to fill the cookie jar and we kids used to empty it. Now we fill the office wastebasket during the day and Katie, the charlady, empties it at night. The locomotive fireman stokes the empty firebox while the engineer pulls the throttle that uses the steam which empties that firebox. The grade-school teacher patiently fills her students' heads with facts and near-facts which is largely relieved in later years by life's best teacher, "Experience." At threshing time, the farmer empties the bundles of grain of their seed only to put some of the same seed back into the same ground the following spring. We empty the metal mines of their ore, bring it to the mill for refining into pure iron, then fabricate that iron into products which again go back into the earth from whence it came.

Mother Nature does the same thing too. She empties clouds of the rain they hold, then evaporates the water from the earth for re-filling. Sometimes she becomes intemperate, like human beings, and goes to such extremes that she causes floods and severe physical damage, both to man and herself. Homo sapiens, in their amazing desire to be intemperate, spend countless years building up racial good will and brotherly love, only to have some handful of psychopaths start wars which speedily empty those good will reservoirs of all their precious content, thereby causing the world no end of trouble, but in the end re-filling the hearts of men with understanding and tolerance.

It's a strange world.

WHEN your pipe lines are "PYREX" brand Industrial Glass, you need never spend hours locating where in your processing system turbidity, discoloration or other similar difficulties, are originating. The crystal clear transparency of "PYREX" Piping clearly reveals its contents at every processing stage.

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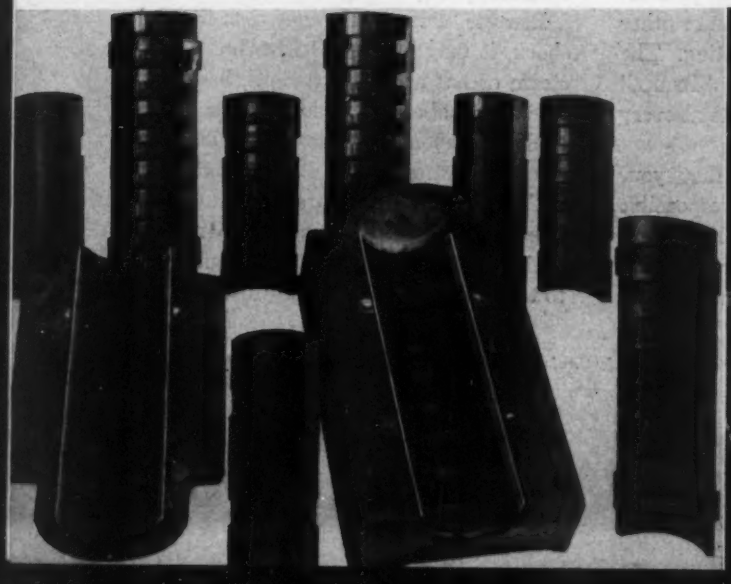
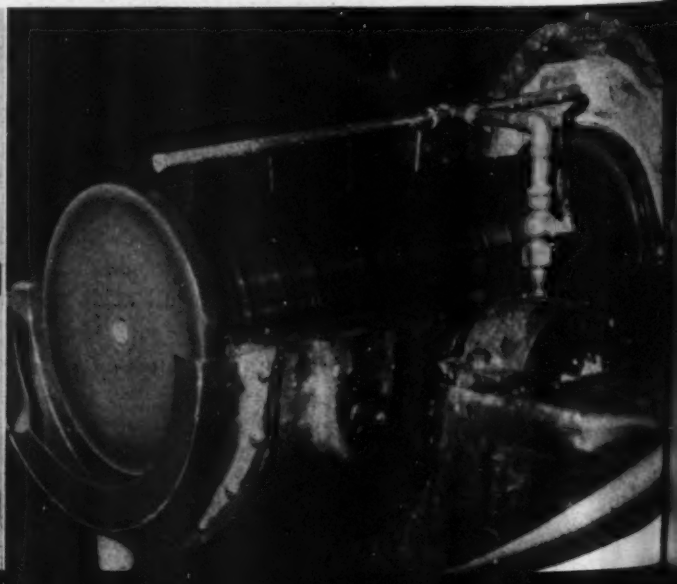




METALLIZING
in Paper Mill Maintenance

W. C. REID[1], Vice President
Metallizing Engineering Company, Inc.

▸▸▸ METALLIZING has a definite place in the maintenance department of every pulp and paper mill. Its universal adoption by numerous other industries, and its successful application in these industries over a period of many years, provide adequate proof that when used correctly and in its logical field metallizing is an invaluable maintenance tool.

In the paper industry, the work to which this process is most advantageously adapted are divided into two classifications. One deals with the restoration to original dimensions of worn bearing surfaces of every description. This classification also is concerned with the protection of bearing surfaces and machined parts against corrosion. The second classification—by far the less important of the two—has to do with the application of coatings on large areas such as tanks, beaters, and digesters, purely for corrosion-resistance.

The relative importance of these two groups cannot be emphasized too strongly. In using metallizing in the past, many pulp and paper mill operators have placed undue emphasis on the strictly corrosion-resistant applications. Thus, the more fertile field of restoring surfaces worn primarily by rotating or reciprocating action has been greatly neglected.

In common with many other processes when they were first introduced years ago, the results obtained by metallizing frequently suffered from an insufficient understanding of the process. Misapplication, too, was particularly prevalent in the paper industry. However, since that time, considerable knowledge of the process has been acquired through extensive research and application. Now, with both spraying technique and equipment perfected, failures need no longer be tolerated.

With practically all metals under priority control, the maintenance of equipment in the paper industry is a problem more vital today than ever before. Machines run longer; parts wear rapidly. Replacements within comparatively short periods of service

(1) Member American Society Mechanical Engineers.

Fig. 1—Cast iron roll being metallized with stainless steel for resistance against corrosion. In order to minimize spraying time, two guns are employed simultaneously.

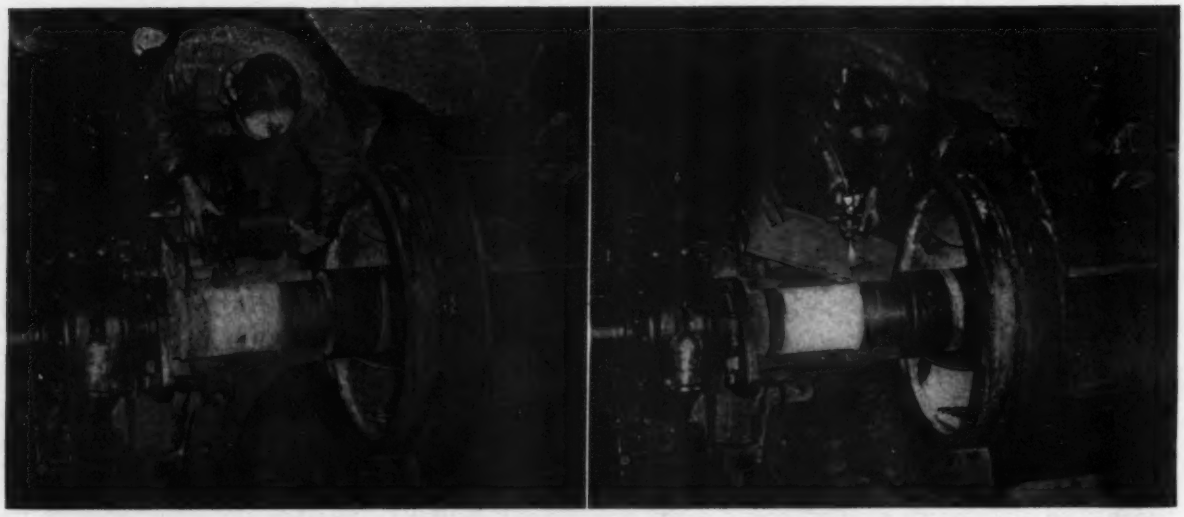


Fig. 2 (left)—Worn packing sleeve on a large circulating pump being prepared, in place, for spraying with a special rotary tool. Fig. 3 (right)—The packing sleeve is sprayed with bronze after which it is machined to size—all without removing the spindle or impeller.

ordinarily are unavoidable. Yet long delays may be anticipated in obtaining such replacements; shutdowns may be necessary, especially if the parts are made with stainless steel, Monel, or other metals.

However, metallizing offers a successful solution to this problem. Worn centrifugal pump impeller spindles and packing glands, stock pump spindles, suction pump glands, feed water pump pistons, plunger pump pistons (single, duplex, and triplex), rolls of numerous types—all of these and many others requiring corrosion- and wear-resistant surfaces may be replaced rapidly in service merely by sprayed coatings of the required metal.

Then there are an infinite number and variety of successfully proved applications involving the restoration to original dimensions of cylindrical bearing surfaces. In the following instances, such applications invariably demand a hard and wear-resistant surface with no particular corrosion-resistant qualities. These include armature shafts, armature shaft bushings (O.D. only), pulper shaft bearings, embossing roll journals, calender roll journals, jordan shaft bearings, and beater shaft bearings.

Next in importance are the numerous opportunities offered by metallizing in the restoring of press or shrink fits. These jobs can be done quickly and economically with sprayed metal, thus reducing considerably the time-out ordinarily required for such work.

All of these applications, and countless others of a similar nature, are common procedure in the maintenance departments of every industry. They have proved so successful that many manufacturers are adopting them as standard procedure in the fabrication of their equipment.

In so far as worn bearing surfaces are concerned, many plants, not acquainted with metallizing, still machine these surfaces undersize and fit new bearings. Consequently, not only is considerable labor entailed, but a multitude of off-size bearings. Large inventories of material are required, and frequent confusion prevails when replacements are necessary. Needless to say, the shafts or spindles themselves are rapidly headed toward the point where further machining is impossible.

Such wasteful and time-consuming procedure can be eliminated entirely. Far less effort and expense are required with metallizing. Original dimensions can be maintained indefinitely on all cylindrical O.D. surfaces by building these up with sprayed metal. Thus, standard bearings always will fit, and, in most cases, can be interchanged easily.

The actual metallizing of the bearing surfaces may be done with relatively unskilled labor—frequently in less time than is required to make an off-size bearing. Above all, the metal-

Fig. 4 (left)—Packing gland areas on a turbine shaft are repaired by metallizing without pulling the shaft. Here the shaft is prepared in readiness for spraying. Fig. 5 (center)—prepared shaft being built up with sprayed stainless steel. Fig. 6 (right)—Built-up shaft completely finished and ready to go back in service.

lized surface is infinitely better and longer lasting than the original. This is due to its low coefficient of friction (approximately 20 per cent less than that of hardened steel). Also its inherent porosity permits the absorption of oil which makes the bearing virtually self-lubricating.

The procedure to be followed in metallizing cylindrical surfaces is relatively simple. It is necessary that the part be mounted in a lathe and the worn section undercut to a depth of approximately 0.020 in. *below the estimated maximum point to which wear can be safely allowed.* The undercut section should be extended at least ¼ in. on both sides of the wear zone. In order to provide a secure bond between the sprayed metal and the base metal, the undercut sections are then prepared with a special rotary roughening tool. The metallizing gun is then mounted in the tool post and the prepared areas are built up gradually by traversing the gun back and forth until sufficient metal is applied to allow 0.032 in. for finish machining or grinding.

More often than not, the entire procedure can be performed with one setup and one operator. Only in the case of roll surfaces is removal from lathe to grinder necessary. Roll surfaces, incidentally, do not have to be undercut since their entire length can be prepared for spraying with just the METCO method (pat. applied for) of grooving plus Rotary Tool.

Sprayed metals are applied very rapidly with modern metallizing guns. Stainless steel, for instance, can be sprayed at the rate of 10 pounds per hour. Thus a roll 36 in. in diameter by 72 in. long, requiring a coating ⅛-in. thick, needs 340 pounds of sprayed metal. It can be applied in thirty-four hours with one gun, or in just half the time if two guns are employed (Figure 1).

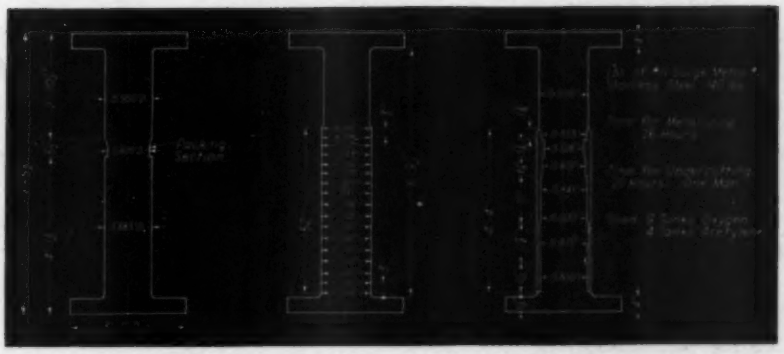


Fig. 7—Water wheel shaft sketches showing (left to right) before undercutting; after metallizing; and after being metallized and ground.

Another example: Two bearing surfaces 6-in. long, such as are found on each end of a 3-in. diameter armature shaft, can have carbon steel (2.5 pounds) applied to a thickness of 1/16 in. within fifteen minutes.

Rolls made from cast iron may be coated with ¼ in. of copper in much less time than is required for sleeving. For example: a roll 12 ft. long by 12 in. in diameter might need 490 pounds of copper. This can be sprayed in 27.5 hours. Furthermore, whereas sleeving requires skilled labor which could be put to advantage elsewhere in the shop, any intelligent apprentice could turn out the metallizing job satisfactorily after a few days' instruction.

These examples are representative of an infinite number of similar ones to be found in every large pulp and paper mill. The savings they afford in time alone are remarkable.

However, there are even still greater time-and-money-saving possibilities with metallizing where jobs can be done *in situ*. Here metallizing eliminates complete disassembly, transportation to and from the machine shop, and subsequent reassembly. One such job is illustrated in progress in Figures 2 and 3. In this instance, a badly worn packing sleeve on a large circulating pump was prepared for spraying by using a lathe compound bolted to the pump frame, metallized with bronze, and remachined—*all without removing the spindle or impeller.* Fifteen pounds of bronze costing $4.95 was applied. The time required for the completion of the job, with the pump in operation, was only 80 man-hours.

A similar job on the carbon seal packing glands of a steam turbine—also completed without dismantling the unit—is illustrated in Figures 4, 5, and 6. Labor and material combined cost but $95.95. If other methods of restoration had been used, the rotor would have had to be removed for sleeving—entailing considerably more time out and a far greater expenditure in labor and material.

For those paper mills having hydro-electric plants instead of steam, water wheels can be maintained indefinitely by filling cavitated areas with sprayed stainless steel. This is a procedure employed by all those major public utilities operating hydro stations. Here again, the work can be done without removing the wheel. The main shaft bearings and packing sections can be renewed in a similar manner. Wicket gate stems can be salvaged by building up the eroded areas with stainless steel and then remachining. They will then give service longer than if new. Figure 7 shows the actual job record and methods employed for the repair of a water-wheel shaft. Figure 8 indicates the procedure adopted for wicket gate stems.

Although it has not been practical to give technical details in this article, the few examples mentioned indicate that, when properly used, metallizing can be an invaluable maintenance tool to the pulp and paper industry. It can save not only time and money, but it will cut down the demand for priority metal because the need for replacements will be less than before.

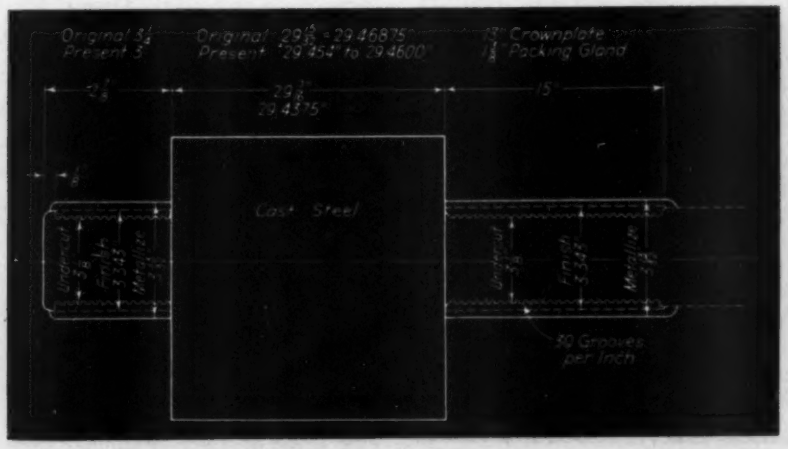


Fig. 8—Wicket gate stem sketch showing dimensions before and after metallizing.

Conditioning Water *for the Paper Mill*

II—Softening of Hard Water

ESKEL NORDELL
Technical Department
The Permutit Company

▸▸▸ THE HARDNESS OF A WATER is caused by and is proportional to its content of soluble calcium and/or magnesium salts. These salts are the bicarbonates, sulphates, chlorides, and occasionally nitrates and these are present in various proportions in various waters. Thus, one water may contain practically nothing but the bicarbonates; another may contain a large amount of bicarbonates and a relatively small amount of sulphates; another may contain a relatively small amount of bicarbonates and a large amount of sulphates, etc.

Furthermore, the total amounts of calcium and magnesium salts, that is, the total hardness content, vary greatly in various water supplies. Excluding sea water and other highly saline waters, the total hardness contents of usable water supplies would range from less than 1 grain per gallon (17 ppm) up to slightly over 100 grains per gallon (1700 ppm). Waters ranging near the last named figure would be considered so exceptionally hard that they would be unusable in any industrial plant. The great majority of natural waters are found in the range of 1 grain (17 ppm) to 30 grains of hardness per gallon (510 ppm).

Hard waters, as is well known, form scale when heated or evaporated or brought in contact with alkaline materials. Also, when brought in contact with rosin or fatty acid soaps, they precipitate insoluble calcium or magnesium resinates or soaps. The scale-forming properties depend not only on the amount of hardness present, but also on the nature of the hardness compounds, while the precipitating action with rosin or fatty acid soaps is proportional to the total amount of hardness present and is independent of the nature of the hardness compounds.

Scale Formation

Scale formation may occur in condensers or in other water-jacketed equipment, hot water piping, stock chests, deckers, screens, dryers, recirculating systems, bleach tanks, boilers, etc. It is important to note that various conditions obtain in different equipment, and just because a water does not form scale under one set of conditions that does not mean it will not form scale under a different set of conditions.

Thus, a water which does not form scale when merely warmed in a cooling jacket, may form a very serious scale when it is concentrated in the steam boiler. This same water also may form troublesome adherent deposits when it is treated either with caustic soda or hydrated lime in the bleach tanks.

The hardness constituents do not always precipitate as an adherent deposit (scale). Instead, they may, under certain conditions, precipitate in a non-adherent form (sludge). Also (and this is the usual occurrence) one portion may precipitate as sludge and another portion as scale.

Calcium Bicarbonate and Calcium Carbonate

Calcium bicarbonate is formed by the action of water containing dissolved carbon dioxide on limestone, calcite, marble or chalk, all of which consist chiefly of calcium carbonate. It is soluble to the extent of 53 grains per gallon (908 ppm) expressed as calcium carbonate. When water containing calcium bicarbonate is heated, the bicarbonate tends to break down, forming calcium carbonate, carbon dioxide and water.

The extent of this decomposition depends on the temperature and the relative amounts of calcium bicarbonate and free carbon dioxide present. In other words, there is a definite equilibrium at each temperature, between the amount of free carbon dioxide in the water and the amount of calcium bicarbonate which can be held in solution. Often, only a slight warming is sufficient to upset this equilibrium and cause formation of calcium carbonate scale. Thus with certain waters, calcium carbonate scale may form even at 90 Fahr., and scale formation has been found exceedingly active at temperatures over 120 Fahr.

The solubility of calcium carbonate in water free from carbon dioxide is slightly less than 1 grain per gallon (17 ppm). In practice, however, it has been found that if the calcium bicarbonate (or carbonate) content is reduced to about 35 ppm (or about 2 grains per gallon), the formation of calcium carbonate scale from cooling water or in the bleach tanks is inhibited.

Magnesium Bicarbonate Magnesium Carbonate Magnesium Hydroxide

Magnesium bicarbonate is formed by the action of water containing carbon dioxide on magnesite, dolomitic lime-

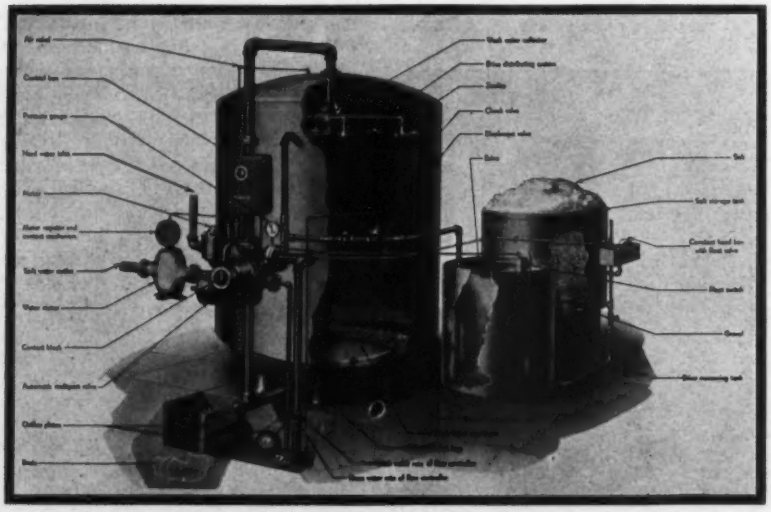


Fig. 8—Automatic Zeolite water softener.

stone, etc., in which the magnesium occurs as the carbonate. It is over thirty times as soluble as calcium bicarbonate, its maximum solubility being some 1610 grains per gallon (27,600 ppm) expressed as magnesium carbonate. Like calcium carbonate, when water containing magnesium bicarbonate is heated, the bicarbonate breaks down into magnesium carbonate, carbon dioxide, and water, the extent of this decomposition similarly depending on the temperature and the relative amounts of magnesium bicarbonate and free carbon dioxide present.

Unlike calcium bicarbonate, magnesium bicarbonate does not usually form a carbonate scale in condensers and other water-jacketed equipment, hot water piping, etc. There are two main reasons for this. The first is that the solubility of magnesium carbonate, being 6 grains per gallon (103 ppm), is somewhat over six times as great as the solubility of calcium carbonate. The second is that in the great majority of waters the magnesium content is usually much less than the calcium content (on the average less than one-half the calcium content).

In the boiler, however, magnesium bicarbonate breaks down not only to the carbonate but continues further to form magnesium hydroxide which has a solubility of only about one-half grain per gallon (9 ppm), and this compound forms scale in the boiler. Magnesium hydroxide also is precipitated in the bleach tanks by the action of either caustic soda or hydrated lime. Under such conditions, however, it tends to disseminate through the pulp rather than to separate out on the sides of the tank as an adherent scale.

Calcium Sulphate

The commonest form in which calcium sulphate occurs in the earth's crust is as gypsum. The solubility of gypsum, expressed as anhydrous calcium sulphate, is 103 grains per gallon (1760 ppm) at 32 Fahr. On warming, its solubility at first increases, reaching a maximum of 123 grs. per gal. (2110 ppm) at 104 Fahr. From there on, its solubility decreases to 99 grs. per gal. (1695 ppm) at the boiling point (212 Fahr.) and sinks to 3 grs. per gal. (51 ppm) at 325 psi boiler pressure and even lower at higher pressures.

Calcium sulphate, therefore, does not form scale in water heaters, hot water piping, or cooling systems unless it is very greatly concentrated by re-use. Due to its low solubility at boiler pressures and the concentrations effected by evaporation, it does form scale in steam boilers, and the calcium sulphate scale thus formed is very dense, hard, and difficult to remove.

Calcium Hydroxide

Calcium hydroxide is also a scale-forming material, its solubility being a diminishing one with increases of temperature. At 32 Fahr. its solubility is 103 grs. per gal. (1770 ppm), while its solubility at 210 psi is only 5.8 grs. per gal. (99 ppm).

Silica

Silica is found in all natural water supplies. The amounts present may range from slightly less than 1 ppm to over 80 ppm. In the lower ranges, silica is probably present as such while, in the higher ranges, as found in alkaline waters, it is probably present as silicate.

Silica forms three types of scale: (1) silica scale, (2) silicate scale, and (3) double silicate scale such as analcite, which is a sodium alumino silicate. These scales are usually dense, hard, adherent, low in thermal conductivity, and difficult to remove.

Water Softening

The processes by which hardness is removed from water are called water softening. Excepting only distillation, which is too costly to be of any but limited applicability, there are two broad classifications for these water softening processes:

1) Base Exchange Processes
2) Precipitation Processes

In the first classification are the sodium zeolite and hydrogen zeolite processes. In the second classification are the cold lime (or lime soda) process and the hot lime soda process. There is also a combination lime zeolite process in which the water is first treated with lime and then passed through zeolite.

The Zeolite Process

The zeolite process may be carried out in either gravity type or pressure type water softeners. As the pressure type is the type almost universally used in industries, this type is the one that will be described.

Figure 8 illustrates a zeolite water softener unit of the pressure type. It consists of a steel shell, designed to withstand whatever pressure will be encountered, holding a bed of granular zeolite, supported by several layers of graded gravel, lying over an underdrain or collector system.

The water to be softened is admitted to the upper portion of the shell and uniformly distributed over the surface of the zeolite bed. It then passes evenly downward through the zeolite bed, during which passage the hardness forming elements—calcium and magnesium—are removed by the base exchanging action of the zeolite and replaced by sodium. This removal of hardness is so complete that the effluent from a zeolite water softener is known as "water of zero hardness" or, more commonly, as zero water. If soluble iron and/or manganese is present in the raw water, they will be removed simultaneously with the removal of the calcium and magnesium.

The softened water passes from the zeolite bed through the supporting layers of gravel and the collector system to the outlet of the softener from

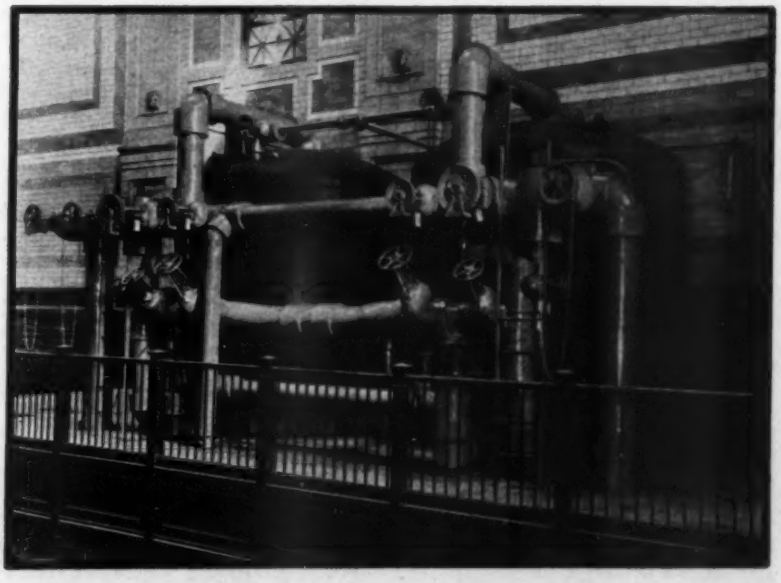


Fig. 8—Carbonaceous Zeolite water softener.

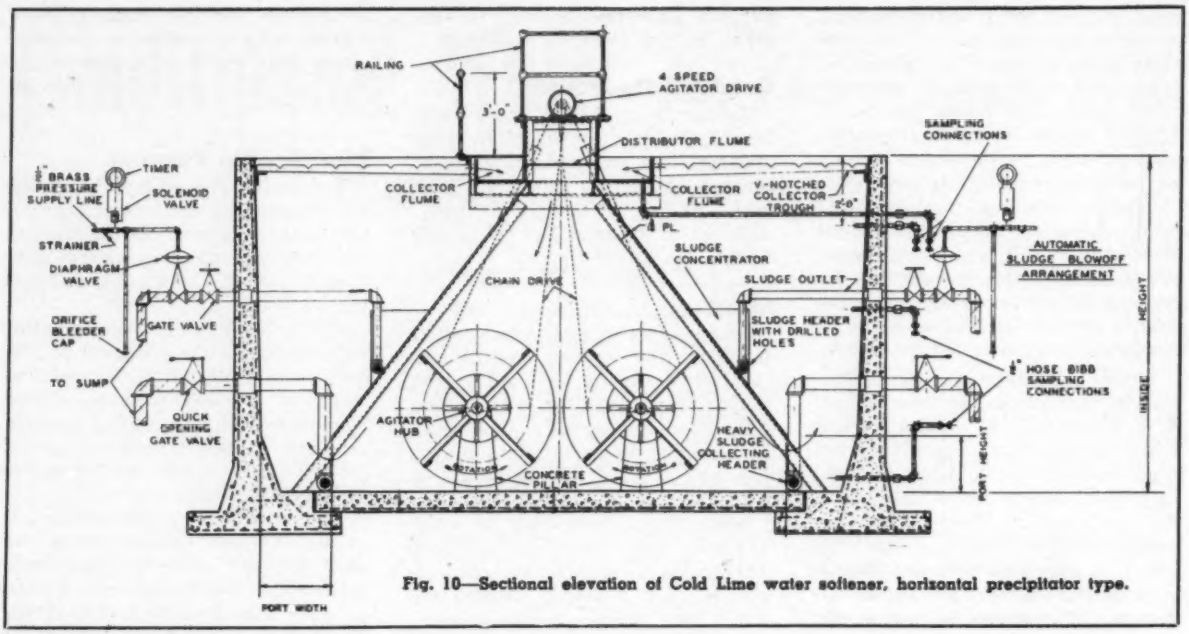


Fig. 10—Sectional elevation of Cold Lime water softener, horizontal precipitator type.

which it passes through the meter to the service lines under whatever pressure is required. In manually operated zeolite water softeners, the hand on the meter is set for the predetermined amount of water that the unit will completely soften. At the end of the softening run, as indicated by the hand on the meter returning to the zero point, the unit is taken out of service, regenerated and restored to service. The softening runs with various zeolite water softeners, operating on various waters and under various conditions, range from slightly less than 4 hours to over 12 hours in length.

The regeneration period with various zeolite water softeners ranges from one-half to one hour. There are three steps to this regeneration.

The first step is backwashing which is accomplished by passing a strong stream of water (6 g.p.m. per sq. ft. of bed area) upward through the softener. This loosens and regrades the zeolite bed; holds it in a semi-suspended state; and removes, by washing up and out any dirt which may have collected on top of the zeolite bed during the softening run. This backwashing takes from 7 to 10 minutes.

The second step is the salting. This is effected by introducing into the softener a predetermined amount of a solution of common salt, by means of a hydraulic ejector, which is an integral part of the softener. This salt solution is uniformly distributed over the surface of the zeolite bed and evenly passes down through it. As it does so, the salt reacts with the zeolite, removing the calcium and magnesium in the form of their very soluble chlorides and, simultaneously restoring the zeolite to its original active or sodium condition. Salting takes from 5 to 10 minutes.

The third and last step is the rinse, which consists of washing the calcium and magnesium chlorides, plus the excess salt, to the drain by means of a downward flow (2 to 3 g.p.m. per sq. ft. of bed area) of the rinsing water. After the rinse, which ranges from 18 to 40 minutes, the softener unit is returned to service ready to soften a further equal quantity of hard water.

In order to insure an uninterrupted soft water service, zeolite water softeners are often supplied in batteries of 2 or more units, so designed and operated that the other unit or units of the battery will handle the full softening load while one unit is being regenerated. In other cases, soft water storage tanks may be employed to tide over the regeneration periods.

Completely automatic zeolite water softeners are available in which a motor-driven multiport valve, coupled with electrical controls, serves to perform all of the operations formerly performed by hand. In these, the length of the softening run is governed by a water meter equipped with an electrical contact head; the length of the backwash period is controlled by an electric time switch; the volume of salt brine ejected into the softener is governed by an electric float switch in a brine measuring tank; and the rinsing period is controlled by an electric time switch.

With the zeolite water softener, the principal operating cost is the cost of the salt consumed during regeneration. This ranges between 0.37 and 0.45 lb. of salt per 1000 grains of hardness (expressed as calcium carbonate) removed.

This range is due to the fact that salt consumption is affected by two factors: the composition of the raw water and the operating exchange value at which the zeolite is to be worked. The lower salt consumption may be attained with waters that are not excessively hard nor high in sodium salts and where the zeolite is not worked at its maximum capacity.

Where available, filtered sea water may be used for regenerating the zeolite water softeners. As the costs for pumping, coagulating, chlorinating, and filtering the sea water are only a small fraction of the cost of purchased salt, the operating costs for a sea water regenerated zeolite water softening plant are exceedingly low.

The Hydrogen Zeolite Process

In the past few years, a new type of zeolite—carbonaceous zeolite—has come into use. On the sodium cycle, carbonaceous zeolites behave much the same as the siliceous zeolites. That is, they exchange sodium for calcium or magnesium on the softening run and at the end of the softening run are regenerated with salt.

It is on the hydrogen cycle, however, that their behavior is quite different. For, on the hydrogen cycle, they remove bicarbonates from water completely, leaving practically nothing in the water but carbon dioxide which is then easily removed by aeration. In addition, they remove not only the bases calcium and magnesium but also

sodium. Therefore, it is now possible to remove sodium bicarbonate from water without having to resort to distillation. Iron and/or manganese if present in soluble form, may be removed by carbonaceous zeolites on the hydrogen cycle in the same manner as and simultaneously with the removal of calcium, magnesium and sodium.

When the capacity of a carbonaceous zeolite unit for producing a completely softened water is exhausted, the unit is cut out of service and backwashed. It is then regenerated with dilute sulphuric acid, which removes the bases—calcium, magnesium, sodium, iron, etc.—in the form of their soluble sulphates, and restores hydrogen to the zeolite. The sulphates and excess acid are then completely rinsed out of the unit after which it is restored to service ready to soften a further equal quantity of the hard raw water.

When waters which, in addition to the bicarbonates, contain sulphates or chlorides are softened through the hydrogen zeolite process, the corresponding mineral acids are formed. Therefore, in handling such waters, it is necessary to neutralize this acid.

If the chloride and sulphate content is low, it is often feasible to neutralize the aerated effluent with small dosages of alkali. In other cases, it may be more economical to run one or more of the carbonaceous zeolite units on the sodium cycle and mix this effluent with the hydrogen zeolite effluent in such proportions as to yield whatever alkalinity is desired in the mixed effluent. As the effluent from the hydrogen zeolite process usually contains a considerable amount of free carbon dioxide, the effluent is usually passed through an aerator or degasifier so as to effect its removal.

The hydrogen zeolite process is coming into extensive use for boiler water conditioning, and also for treating those natural water supplies which contain appreciable amounts of sodium bicarbonate. The consumption of sulphuric acid used for regeneration varies somewhat with different waters, but with the majority of waters it is ¼ lb. of acid per 1000 grains of hardness or sodium (expressed as calcium carbonate) removed. Figure 9 is a view of a typical carbonaceous zeolite water softener.

The Cold Lime Process

The cold lime or lime soda process of water softening is a precipitation process. The chemicals—lime, or lime and soda ash—are added to the cold water where they react with the hardness constituents to form precipitates which are removed by settling or by settling and filtration.

The amounts of chemicals depends on what results are desired. For instance, if it is desired to reduce only the calcium bicarbonate content, then just sufficient lime is added to accomplish this purpose. If it is desired to reduce the magnesium content also, then more lime is added, while, if the water contains non-carbonate hardness, which it is desired to reduce, then soda ash also is added.

The function of the lime is to remove carbon dioxide; to change the bicarbonates to the carbonates, and to change magnesium compounds to the hydroxide. The function of the soda ash is to change the non-carbonate hardness to the carbonates. In addition, a coagulant, usually sulphate of alumina, is frequently employed to aid in settling the precipitates. The sludge produced consists principally of calcium carbonate or of calcium carbonate and magnesium hydroxide.

In the old type, the combined reaction and settling tank is usually a high, cylindrical tank equipped with a centrally disposed open ended cylindrical steel downcomer placed so that its bottom rim is some distance above the bottom of the settling tank.

The raw water, as it enters the top of the downcomer, is dosed with the required amounts of chemicals, which are mixed with the water by means of a series of baffles or by a motor driven agitator. The precipitates, formed by the action of the added chemicals with the hardness of the raw water, drop to the bottom of the settling tank as a sludge and this sludge is removed at intervals by means of a sludge removal system or spider connecting through a quick opening valve to the drain.

At the lower rim of the downcomer, the treated water reverses its flow and rises through the outer section to the draw-off at the top of the settling tank, from which it usually passes through filters to service. The detention period in this type of settling tank is usually four hours or more.

In the precipitator, Figure 10, the design is such that the raw water is thoroughly mixed with, and then filtered through, previously formed sludge. This intimate contact with the solid phase inhibits super-saturation and, therefore, produces a stable effluent. Due to this, the detention period in the precipitator need be only one hour instead of the four hours required in the older types.

The flow of the water in the precipitator is downward through the centrally disposed mixing chamber where it is mixed with the required dosages of chemicals and thoroughly agitated with previously formed sludge. Emerging from ports at the bottom of this chamber, it then filters upwardly through a semisuspended blanket of sludge, the height of which is kept at a constant level by bleeding off (through a concentrator) the excesses of sludge as fast as formed.

As the water rises through this outer compartment, a very thorough settling is effected as, due to its constantly increasing cross-sectional area, the upward velocity of the treated water constantly decreases. Due to this decreasing upward rise, a plane is reached at which the upward flow is too slow to lift the precipitates any further. Consequently, the precipitates in a semisuspended condition are left behind. In practice, this plane of demarcation between semisuspended precipitates and settled water is clearly defined. The settled water then flows from a collecting trough at the top of the precipitator, either direcly to service or through filters to service.

Removal of Calcium Bicarbonate and Lime Recovery

As stated under "Calcium Bicarbonate and Calcium Carbonate," a reduc-

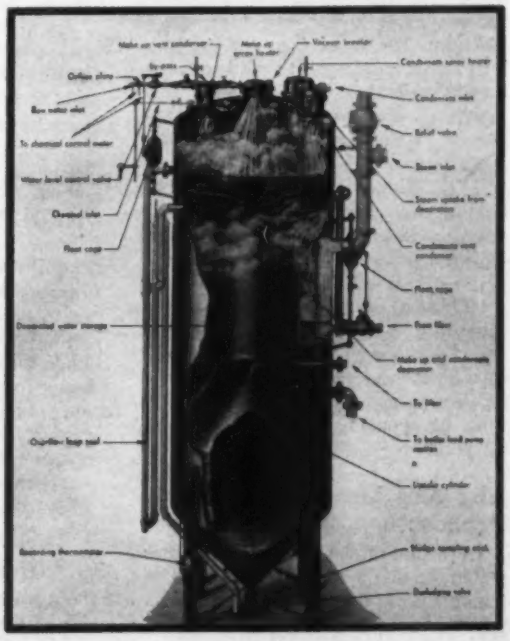


Fig. 11—Hot Lime soda water softener.

tion of the calcium bicarbonate content (expressed as calcium carbonate) down to 35 ppm or about 2 grains per gallon is usually sufficient to stop scale formation in condensers, other water-jacketed equipment, hot water piping, stock chests, screens, recirculating systems, deckers, etc. In such cases, therefore, it is usually unnecessary to add to the water more lime than is required to reduce the calcium bicarbonate content to this concentration. Such treatment is best carried out in the precipitator-type of equipment so that a stable effluent will be produced.

As the sludge produced is practically pure calcium carbonate, recovery of the lime (where lime recovery equipment is in use as in soda and kraft mills) is feasible. As in the reaction with calcium bicarbonate, each equivalent of added lime takes down with it one equivalent of lime from the calcium bicarbonate, the amount of lime recovered is practically twice the amount that is added.

If, as is the case in some mills, the cost of new lime is about twice the cost of recovering and reburning the sludge, then obviously the cost of treatment, since twice as much is recovered as is added, is practically nothing except for the cost of a small amount of coagulant and the lime required for reacting with it or with free carbon dioxide. Even where these conditions do not obtain, the treatment costs for removing calcium bicarbonate are very low.

Removal of Calcium and Magnesium

By using larger dosages of lime, the magnesium, as well as the calcium, will be precipitated. As magnesium carbonate is soluble to the extent of about 103 ppm (or about 6 grains per gallon) it is necessary to add enough lime to maintain a *p*H value which will precipitate the magnesium as the hydroxide, which has a solubility of only about 9 ppm or ½ grain per gallon.

The addition of soda ash is required for the reduction of noncarbonate hardness. Soda ash also is necessary if low hardness effluents are to be produced because soda alkalinity is required to force these reactions and reduce the solubilities of the precipitates. Therefore, by varying the dosages of chemicals, different degrees of softening may be accomplished down to a practical limit of about 1 grain per gallon or 17 ppm.

The Hot Lime Soda Process

In the hot lime soda process of water softening, the water is first heated to temperatures at or near the boiling point; it is next treated with the required dosages of hydrated lime and soda ash, then settled, and finally filtered. The lime and soda ash react with the hardness to precipitate the calcium and magnesium in the raw water, plus the added lime, as a sludge consisting of calcium carbonate and magnesium hydroxide.

As chemical reactions proceed much faster at higher temperatures, more complete softening may be effected in the hot lime soda process than in the cold lime soda process. In the hot lime soda process, a 2 grain per gallon (34 ppm) excess of chemicals will yield an effluent containing a total calcium and magnesium hardness of less than 1½ grains per gallon (26 ppm). Since the water must be heated to approximately the boiling point, the hot lime soda process of water softening is limited to those applications where the water is to be used hot—principally for boiler feedwaters.

The equipment used in this process, when treating water for high pressure steam boilers, usually consists of the following five elements:

1) Primary Heater
2) Chemical Feeds
3) Settling Tank
4) Deaerating Heater
5) Filters

In softening boiler feedwaters for low pressure boilers, the fourth element—the deaerating heater—is often omitted.

Figure 11 illustrates a typical hot lime soda water softener plant. In this, the water, on its way to the primary heater in the top of the settling tank, passes through a water meter, equipped with an electric contact head, which actuates the chemical feed.

Exhaust steam is employed to heat the raw water, and, where a deaerating heater is employed, all of the steam used is first passed through the hot, treated water in the deaerating heater, thus effecting a complete scrubbing and deaeration, before it passes to the primary heater.

In the primary heater, the water is sprayed down through the steam in the head of the settling tank. This heating liberates the free carbon dioxide and the dissolved oxygen and nitrogen from the water and discharges them, either through a vent or a vent condenser to the atmosphere. The deaeration taking place in this primary heater is sufficient to lower the dissolved oxygen from saturation limits down to less than 0.3 cc. per liter.

The chemicals, hydrated lime and soda ash, are charged in weighed dosages in known volumes of water into the chemical feeding tank where a mechanically driven agitator serves to keep the lime in an even suspension. As for the soda ash, of course, both it and any caustic soda formed from it are wholly soluble and therefore evenly distributed. The chemical charges are usually so sized that charging is necessary only once per shift or at even longer intervals.

As a certain unit volume of water passes through the meter, the draw-off pipe is lowered a definite distance in the chemical feeding tank and thus draws off a definite vertical slice of the contents of the tank and this is repeated for each succeeding unit volume of water which passes through the meter. Thus, the chemicals are drawn off at a rate proportionate to the varying flows of water passing through the meter. A chemical pump then lifts these chemical dosages and discharges them into the heated water in the upper portion of the settling tank.

As the chemicals come in contact with the hot water, they react with it to precipitate both the lime in the water, and the added lime as calcium carbonate, and the magnesium as magnesium hydroxide. These precipitates grow larger and heavier as the water passes slowly downwardly in the settling tank and, when the water reaches the lower edge of the draw-off chamber and slowly rises through it, the precipitates continue to fall to the conical bottom of the settling tank where they collect as a sludge. This sludge is drawn off periodically to waste by means of a manually-operated or automatically-operated sludge valve.

From the draw-off chamber, the water then passes to the deaerating heater, which may be an integral part of the settling tank, as shown, or a separate piece of equipment. In this, the water is thoroughly scrubbed with all of the steam required for the primary heater. As the temperature of the water entering the deaerator is within a couple of degrees of the temperature of the steam, a very complete deaeration is effected, furnishing an effluent with less than 0.01 cc. of dissolved oxygen per liter. The settled water from the deaerator, containing but a relatively small amount of flocculent matter, is then passed through filters from which it is delivered to service. These filters are of the closed, pressure type and are filled with a non-siliceous filter medium such as carefully graded anthracite or calcite supported on several graded layers of larger material much as has been described for the sand and gravel used in sand filters. The reason for using non-siliceous material in place of the customary sand and gravel is to eliminate all danger of silica pickup by the hot alkaline effluent of the settling tank.

(Concluded on page 686)

TROUBLE *on the Paper Machine*

V—REEL AND WINDER

ARCHIE McCAFFERY

▶▶▶ If the *reel runs hard on the edges,* apply friction to the ends of the calender rolls by running wrapper pads; or, if that procedure fails to bring down the edges, thin out the edges at the wet end.

It is just too bad if the ends of the calender rolls are so worn that a great deal of heat is required to expand them in order to bring down the edges of a reel. Likewise, if the ends of the rolls are badly worn and friction is applied to a roll in the stack in line with the end of the reel where the paper runs hard, the friction will not cause the roll to pinch where it will do the most good. To be sure, heat from the friction will expand the roll in the worn area but not enough to pinch the paper there. Further in on the stack, however, the sheet is affected by the expansion of the roll in such a way that the reel remains hard on the edge but is soft just inside the edge. On the other hand, if most of the rolls in the stack are worn and an attempt is made to expand a newly ground roll to help a hard edge, the sheet, if the roll is expanded very much, will be filled with cracks on the edge—every little foreign particle that comes along the edge being good for a crack. If such cracks are not noticed when the reel is winding up, they will be when the winder starts running. The remedy is to change the worn calender rolls.

Reels must not be run *slab-sided,* if good rolls are to be made. If the paper is lighter on one side than the other, the sheet must be brought up on the light side. If the presses are weighted harder on one side than the other to dry a wet streak in the sheet, the reel might not be affected much until the felts become dirty; then the side of the sheet weighted the harder will be slab-sided when wound into a roll. The only way to overcome this trouble is to wash the felts.

If the *reel contains soft spots,* the use of air blowers on the calenders may correct the difficulty. Should the blowers fail to do the job, the condition may be improved by thickening the sheet at the wet end in the areas of the spots.

If a *reel slips,* the best way to get rid of the slipping is to change the reel as soon as the other reel is empty and wind it off. Bothering with a slipping reel is poor practice on any machine.

An *unevenly calipered reel* is not an uncommon occurrence around a machine that is being forced beyond its capacity. Reels often run up in a way that keeps the backtender chasing the air from one soft spot to another. Although the spots appear to be brought up by the air, they only change position and enter other portions of the sheet. The calenders may be blamed for the trouble, but often there is nothing wrong there. This trouble frequently is caused by the head boxes and slices. If the stock cannot be put under the slices and maintained on the table without skating, the make-up of the reel surely will show the disturbances. The backtender can do little to improve matters unless proper corrections are made at the wet end.

Sometimes, with an evenly calendered web of paper on the reel the *rolls on* the *winder* may *corrugate.* This trouble may be due to uneven drying of the sheet; or it may be the fault of the winder. If the winder is at fault, there is little the machine crew can do to overcome the difficulty except to report the mechanical defects and have them corrected.

There are gadgets, however, for taking corrugated spots out of rolls. One such gadget, a motor-driven unit, keeps the reel, when winding off moving alternately a few inches in opposing directions. If a spot is not very wide, this apparatus will save a lot of paper.

The tightening of chains for the purpose of shifting weight on one side or the other of the winder may or may not be an effective way to get rid of a corrugated spot. The author has never cared for this procedure, since a third hand, who may make use of it, is apt to forget the change in adjustment and thus fail to return it to normal position at the right time. Might it be emphasized, however, that there are no winders designed to make good rolls out of "bum" reels.

A sheet that is not perfect as to caliper over its entire width is going to lay harder on the drums in the spots where the caliper is greater. In case of a hard edge in the reel, or, in other words, greater caliper on the edge of the sheet than elsewhere, the drums are going to push harder on this edge than on the rest of the sheet. This pushing will twist the roll and cause a corrugated spot to develop, especially if there is a damp streak elsewhere in the sheet.

If the *drums* are *not level,* bad rolls will result regardless of how nearly perfect the paper is calendered. The shaft upon which the rolls are wound should set in its boxes in a way that the bearing on both drums will be perfect. Otherwise, only badly wound rolls will result.

Often the paper will take the finish in such a way that the *reel* running up will be little different than the *form of a cone.* Soft spots may be absent from such a reel and winder help may have the good fortune to unwind it without putting in corrugated spots; but how is the sheet in such a roll going to draw when being run through a printing press? Nothing can be done to draw such a sheet straight.

It is the responsibility of the boss machine tender to keep the winders in repair and to make it possible for a backtender to make a reel. If the sheet is weak and will not run over the

If the reel runs hard on the edges ● Reel contains soft spots
Reels slab-sided ● Reel slips ● Unevenly calipered reel
Reel runs up in form of a cone ● Rolls on winder corrugate
Roll slips ● Journal of bottom calender roll running hot
Drums not level ● Sleeves of slitter roll scarred and pitted
Slitting results in poor edges ● Top slitters too deep in sheet
Slitters cut badly ● Side slitters cut narrow and wide
Slitters too dull ● Sheet off center in calenders
Dryer bearings wear away faster on back side than on front side
Undue wear of packing boxes ● Rolls on winder run together

machine or winder, the responsibility lies on the boss machine tender or someone else other than the machine help.

The author recalls a personal experience of some years ago when he took a job as backtender in a mill that was having trouble winding the paper. It was the policy of the mill at the time to fire the backtender the first time the machine shut down for reels. Since the machine was equipped with a stack reel and the reels were very close together, a winder operator did not have to lose much time around the winder to make it necessary to shut down the machine.

The winder was a single-drum, two-shaft affair, and the front *journal of* the *bottom calender roll* was *running hot*. The front edge of the roll produced by the winder was plenty hard but further in on the winder the roll was soft. This difficulty brought about a change in backtenders every two or three days, as no one could keep up on the reels.

So long as the edge of the reel stayed hard, the author did not blame the bottom roll of the calenders for the trouble. Afterwards, he learned that a hot bottom roll could cause this trouble, and, in all probability, did cause it in the incident cited. In fact, if the edge of a reel stays hard when there is a hot bottom calender roll journal, it is because the other rolls in the stack keep it up.

The fact is that here was a case of lack of knowledge on the part of everyone responsible for machine operation; yet the blame was placed on the winder operator for his failure to keep up with the reels.

There is no training school for machine room employees other than the mill itself. All too often, if these employees lack experience or knowledge, they are left alone to profit by their mistakes rather than being trained by the boss machine tender, machine tender, or both.

Little trouble is experienced with rolls of most grades of paper slipping on a drum winder if the paper is calendered properly and started on the winder tightly. Where the power that winds the rolls is applied to the core upon which the rolls are wound, the situation is different. Under such a circumstance, it would be difficult to keep a *roll* from *slipping*. Such a winder may be used where high machine finish is required regardless of caliper variations; but to operate it most satisfactorily, clamps must be provided for the rolls.

If the *sleeves of* the *slitter roll* become *scarred and pitted*, there is little likelihood of good rolls being made until something is done for the sleeves. They either will have to be changed, or the roll put into a roll grinder and the sleeves turned down. Turning down the sleeves, however, reduces their total circumference and it can be done only a couple of times without bad effects. It seems that the slitter roll should be driven by an expansion pulley or other device that would permit it to travel at the required peripheral speed even after grinding.

If *slitting results in poor edges*, check the slitter for correct adjustment. Sharp common slitters may cut poor edges if the slitter board is set improperly or if the top slitters are set too far forward.

It is not unusual for the *side slitters* to *cut narrow and wide* if the top slitters are set too far forward. In such a case, set them back; and they will turn easier and cut straighter and better.

A wet edge will cause outside *slitters* to *cut badly*.

If the slitter board has a very pronounced cant, a feature of one winder no longer being made, discretion must be used in setting the *top slitters* back to prevent them from being *too deep in* the *sheet*. A machine tender who has a winder with a slitter board should have a straight edge for use in keeping the board set right and should use it.

The winder often will run all right with the slitter board out a little if the sheet is strong, or if the reel is nearly perfect. However, when something happens to cause the sheet to be off a little, rather frequent splicing of the rolls will be required until the machine is shut-down for reels and a correction made. If the machine tender keeps the board in line, an operation that takes only a few minutes, all this trouble is eliminated.

Another source of trouble is a winder with slitters that are not functioning properly. It is poor policy to keep *slitters* in operation so long that they are *too dull* to do a good job. A little ingenuity is required to keep a slitter wheel which runs against a sleeve-covered roll in shape. A wheel of this kind will not run when sharp; neither will it run when dull. Its cutting edge should be oval shaped rather than dull. If such a wheel becomes dull and the edge can no longer be kept oval, a new one should be installed in its place. A new wheel also should be substituted for a wheel containing a nick.

A sharp edge on a slitter wheel of this kind can be rounded off with a piece of emery cloth.

One of the most common causes of winder trouble is a *slab-sided reel*. Whether slab-sidedness is caused by a hot bottom calender roll journal or something else, it would be phenomenal if such a roll does not give trouble on the winder.

Sometimes, because of a spot on the wire, or because of a narrow felt, etc., the machine tender may trim off a large strip from the side of the sheet, rendering the *sheet off center in* the *calenders*. This action causes more weight to be applied in the calenders to the sheet on the side being trimmed which makes the reel slab-sided. This fault can be corrected in a measure by running the sheet heavy on that side but, in so doing, it throws the weight of the paper out of balance.

The sheet of paper is supposed to run in the middle of the calenders. If a sheet is put off center three or four inches in this manner, it is next to impossible to keep a reel of paper as bulky on the off-center side of the machine as on the other side.

If a condition of this kind cannot be avoided, it is well, if at all possible, to trim off a shaving from the opposite side of the sheet at the wire. It is surprising how much difference a shaving one inch wide will make in leveling up a reel of this kind.

Most always it is the back side of a slab-sided reel that is the less bulky, since presses invariably have to be weighted harder on the back side than on the front to obtain uniformity in sheet drying. This practice thins and lengthens the sheet on the back side and results in a slack draw in the back side of the sheet at the presses, over the dryers, and through the calenders.

The *dryer bearings wear away faster on the back side than on the front side* because of the added weight of the dryer gears. This condition causes a greater volume of water to accumulate in the bottoms of these dryers at the back side, which, in turn, prevents the paper from drying as readily in that area as on the front side. Although bearings on the back side of the top dryers also wear faster than do the bearings on their front side, the accumulation of water in the bottoms of these dryers at the back side has not the same effect as water in the bottom dryers since the sheet does not contact these dryers on their bottom surfaces.

If dryers could be kept level, it would not be necessary to increase the weighting on the back side of the presses over that of the front. The letting down of the dryers on the back side also causes *undue wear of* the *packing boxes* of the piping hook up and possibly even a break in the piping system.

What has been said about dryers in the making of reels applies equally

(Concluded on page 686)

PAPER SKETCHES

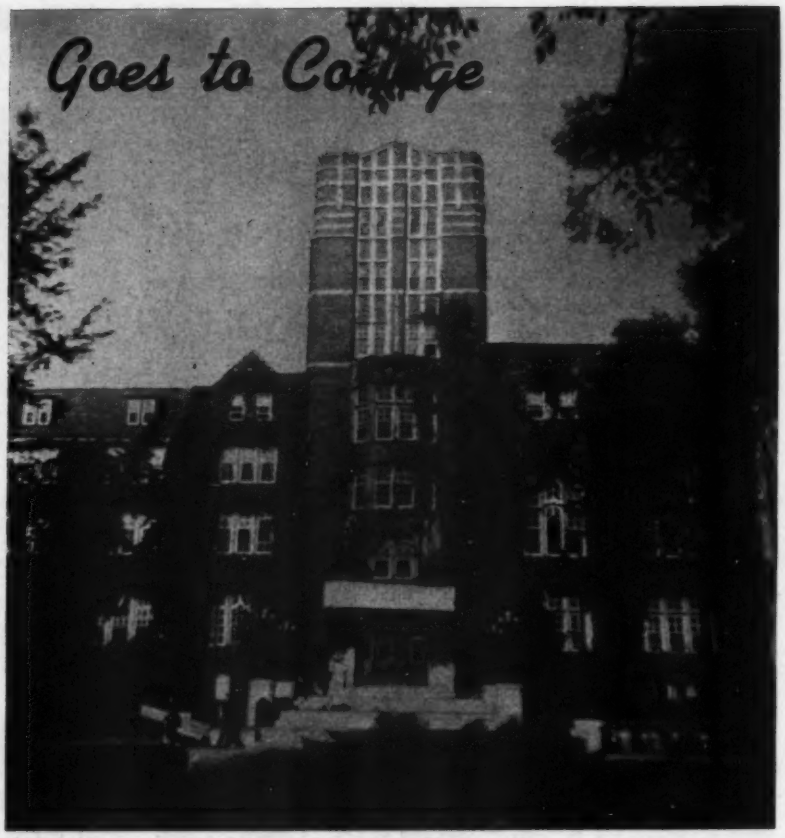
LILY PONS OF THE METROPOLITAN OPERA COMPANY, BECAUSE OF A CAMPAIGN STIMULATING THE COLLECTION OF WASTE PAPER, ACCORDING TO PUBLISHED RECORD, ON SEPTEMBER 23, 1941 GAVE UP 20,000 LETTERS, CONSTITUTING HER FAN MAIL, FOR USE IN THE PRODUCTION OF PAPER OR PAPERBOARD. THE RECORD ALSO STATES THAT MISS PONS PURCHASED DEFENSE STAMPS WITH THE $2.92 SHE RECEIVED FOR THIS FAN MAIL AS WASTE PAPER.

THE FIRST AMERICAN-MADE FOURDRINIER WAS INSTALLED IN THE MILL OF AMOS D. HUBBARD AT NORWICH FALLS CONNECTICUT, WHERE IT WAS PLACED IN OPERATION IN MAY, 1829.

A STRIP OF CHARRED PAPER WAS ONE OF THE FIRST FILAMENTS USED BY EDISON FOR HIS INCANDESCENT LAMP.

BEFORE 1799, TAILORS TOOK MEASUREMENTS WITH INDIVIDUAL SLIPS OF PARCHMENT OR PAPER WHICH THEY HUNG ON PEGS UNTIL REQUIRED, THE INCH MEASURING TAPE BEING UNKNOWN TO THEM.

TAPPI *for* Annual Fall Meeting



The Michigan Union, center of men's activities at the University, was general headquarters during the TAPPI convention.

▸▸▸ JUST A WEEK BEFORE students arrived for the fall semester at Michigan State University, the technical men of the paper industry met at that same institution. To many of them, the experience was reminiscent of the days when they returned to their own alma mater to push on toward the goal of their ambitions. Now they are engaged in another cycle of their life's work, and each member of the Technical Association of the Pulp and Paper Industry who attended the twenty-sixth annual fall meeting at the University of Michigan, Ann Arbor, went with a determination of purpose and a mind tuned to the more serious aspects of this meeting. It was an educational setting, and they are all men engaged in educational work in industry. Each one had an objective—the solution to some particular problem confronting him and his work in the industry.

Notwithstanding the serious, at times almost grim, tone of the subjects considered at this three-day meeting which opened September 16, there were even more than the usual enjoyable features of such conventions. Seldom do men occupied with industrial problems have the privilege of hearing such a galaxy of important speakers—a long list of highly trained

Following one of the morning sessions, this photograph of TAPPI delegates was taken at the entrance to Rackham Building where most of the general sessions were held.

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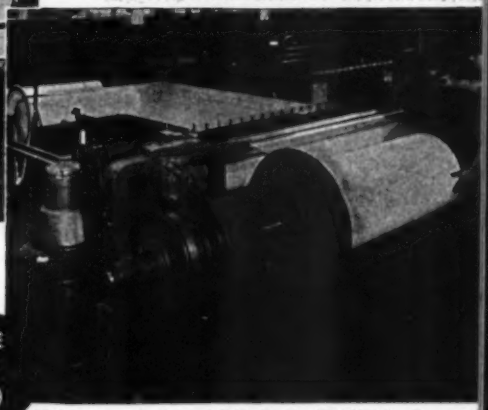

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PITTSBURGH · PORTLAND (ORE.) · ST. LOUIS · SAN FRANCISCO
SYRACUSE (NEW YORK) AND OTHER PRINCIPAL CITIES

Towering above the Horace H. Rackham School of Graduate Studies (right) where most of the TAPPI general sessions were held is the Burton Memorial Tower, (left), a monument to Marion LeRoy Burton, who was president of the University of Michigan from 1920-1925. Atop this tower is the Baird Carillon, the third largest carillon in the United States. This 53-bell carillon was a gift to the University by Charles Baird, class of '95.

and specialized men, each of whom made a masterful presentation of his particular subject. And for TAPPI's pleasure, the University staff, working through a large number of committees, held "open house" on the campus throughout the convention.

The enrollment at this meeting was the largest on record for a TAPPI fall meeting. The American Paper and Pulp Association was represented officially by its president, J. L. Riegel, and E. W. Tinker, executive secretary. Robert L. Eminger, secretary-treasurer of the American Pulp and Paper Mill Superintendents Association, brought greetings from that organization. Outstanding, too, were the industry's representatives in the service of the Government, although duties in Washington prevented D. C. Everest from attending and filling a prominent place on the program. Speakers present from the OPM included H. F. Taggart, assistant director of OPM, and Samuel L. H. Burk. But the convention had the special privilege of hearing twice on Wednesday—first in the afternoon and again that evening—an address by Norbert A. McKenna, chief of the Pulp and Paper Section of the OPM. Mr. McKenna came to Ann Arbor direct from Chicago where he spoke before the National Paper Trade Association. After hearing Mr. McKenna speak, all went away convinced that as far as is humanly possible, everything is being done to help the industry—that the cause is in good hands. Mr. McKenna spoke fluently and with deep sincerity, and his remarks proved a high regard for the industry and its ability to meet the present emergency.

The Kalamazoo Valley Section of TAPPI worked earnestly for the success of the meeting. A carefully planned program and a full schedule of entertainment events left not a dull moment during the entire three days. Everyone present felt the friendly helpful leadership of R. A. Hayward, president of the Kalamazoo Vegetable Parchment Company and national vice president of TAPPI, who, as general chairman of the meeting, gave unstintingly of his time. D. W. McCready, of the University of Michigan staff, and W. K. Kidder, of the Bryant Paper Company, Kalamazoo, were vice chairmen, and the tireless effort and splendid supervision they lent to the arrangements, was evidenced by the well organized system which added so much to the comforts and convenience of all present.

The meeting at Ann Arbor will be recorded as one of the most colorful in TAPPI's history, and it fitted in admirably with the year 1941, in which year the Technical Association of the Pulp and Paper Industry is celebrating its silver anniversary.

The regular sessions of the convention did not begin until Tuesday, the 16th. However, on Monday a large number of delegates were on hand for registration, while some took advantage of the day to visit mills in Detroit, Kalamazoo, and Ypsilanti. The Michigan Union, luxurious center of men's activities at the University, was TAPPI headquarters, and on Monday evening those arriving early had the opportunity to see motion pictures of

Groups enjoyed friendly conversation on the steps of Rackham Building during intermissions.

A Suggestion

for the Consideration of Paper Manufacturers

Normally it is wise to anticipate the failure of a Fourdrinier wire by replacing it when the plant is "down." Unusual conditions, however, call for unusual procedures. May we venture, therefore, to offer a suggestion for your earnest consideration?

It is probable that the additional hours of service to be had from running a succession of Fourdrinier wires until each one actually fails would soon equal the entire term of service that would be given by a new wire. If that is true, does it not follow that the saving thus effected would more than offset the economy of changing wires over the week-end? And if *that* is true, and each manufacturer of paper could, in a year's span, do with even one less wire, then we manufacturers of wire cloth would be able to make our production go further and to conserve our available supply of copper.

The fact is that a shortage of copper is driving our way. From both the selfish and the patriotic viewpoints, it behooves all of us to save every ounce of metal and all other essential materials by the adoption of every rational course of action.

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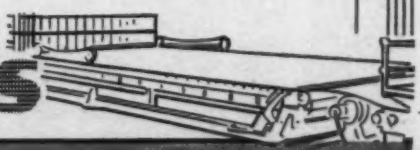


Lindsay **WIRES**

FOR PAPER MILLS

At a special luncheon the first day of the convention, this group of TAPPI leaders held a conference in the Michigan Union. Around the table, left to right, are: R. G. Macdonald, national secretary of TAPPI; J. R. Dufford, Patterson Parchment Co.; Charles A. Fisher, director, University extension service; Allen Abrams, technical director, Marathon Paper Mills Co., also a past president of TAPPI; Virgil Jordan, president of the National Industrial Conference Board; W. H. Swanson, president of TAPPI; R. S. Hatch, technical director, Weyerhaeuser Timber Co., and TAPPI past president; R. A. Hayward, president of Kalamazoo Vegetable Parchment Co., and vice president of TAPPI. Mr. Hayward also was general chairman of the convention. At his left are John Hayward, Prof. Ivan C. Crawford, dean of the University College of Engineering; Harry Fletcher, who was the first president of TAPPI; Earl Rowe, Great Lakes Pulp and Paper Co., Ltd.; Clarence S. Yoakum, dean of the Horace H. Rackham School of Graduate Studies; W. K. Kidder, Bryant Paper Co., who was on the Program Committee; and George K. Spence, Castanea Paper Co., and another past president of TAPPI.

the Michigan Football games, which were shown in the ballroom of the Union.

The general morning sessions were all held in the Rackham Building, a short distance from the Michigan Union. The beautiful lecture hall of this fine building with its modern lighting effects and ultra-modern accommodations was indeed a most unusual setting for these meetings. Facing a broad plaisance with the Michigan League Building at the left and the Burton Memorial Tower on the right, this imposing structure, the School of Graduate Studies, seemed especially fitting for the meetings of the Technical Association. The academic atmosphere was further borne out by the chimes from the Charles Baird Carillon in the Burton Tower. This memorial carillon ranks as the third largest in the United States.

▶▶▶ On Tuesday morning, Chairman Hayward opened the first session and introduced Ivan C. Crawford, Dean of the College of Engineering of the University, who welcomed the Association to the University and to Ann Arbor. Dean Crawford reviewed the history of the University, and presented many interesting facts that were new to some of those present. The University of Michigan actually is older than the State itself, for the University had its beginning in 1817 when a protestant minister and a priest formed its first faculty in Detroit. In 1837, the school was reorganized and transferred to Ann Arbor.

Those who attended the opening session had expected to hear D. Clark Everest, Pulp and Paper Industry Advisor to the Office of Production Management, speak on "The Paper Industry and National Defense." But instead, Mr. Hayward read a letter from Mr. Everest expressing his regrets that duties in Washington prevented him from making the trip to Ann Arbor. In his message, Mr. Everest mentioned the fact that Mr. McKenna, Chief of the Pulp and Paper Section of the OPM, would be at the meeting and that he would outline the work of the OPM.

Chairman Hayward substituted with some very interesting highlights drawn from his own work as a member of the Advisory Committee of the Pulp and Paper Industry. He spoke particularly of the shortage of waste paper and the need for its conservation; of the acute shortage of chlorine which is impending, and he referred to the recently organized Metals Committee of the Paper Industry which is co-operating with the American Paper and Pulp Association.

Following a short recess, those present at the opening session on Tuesday morning heard one of the most outstanding talks given at any of the sessions. This address was on the subject "Current Economic Tendencies and Conditions in This Country," by Virgil Jordan, president of the National Industrial Conference Board, and those who heard it were indeed fortunate, for Mr. Jordan's talk was strictly "off the record."

▶▶▶ W. H. Swanson, national president of TAPPI, presided over the general session on Wednesday morning when three prominent speakers were introduced. "The Work of the American Paper and Pulp Association" was presented by the Association's president, J. L. Riegel. "Current Problems of the American Paper and Pulp Association" was treated by E. W. Tinker, executive secretary of the Association. H. F. Taggart, assistant director, Office of Price Administra-

W. H. SWANSON
President of TAPPI

tion, spoke on "Price Control Policies."

Following a short recess, another interesting address on "Post War Economic Problems," was given by W. Haber, Professor of Economics, University of Michigan.

Only two papers were scheduled for the morning session of the last day. Samuel L. H. Burk of the OPM, formerly personnel director, Atlantic Refining Company, spoke on "Labor Relations." W. B. Stout, president of Stout Engineering Laboratories, was scheduled to speak at this time on "Romance of Research," but on account of being engaged in government work, he was unable to be present. In his stead, Dr. A. E. White, director of the Department of Engineering Research of the University, delivered an address on the subject assigned to Mr. Stout.

The morning sessions were of general interest, and were attended by a large number of the men and some of the women. But on Wednesday and Thursday afternoons, the sessions were devoted to highly specialized subjects of particular interest to the various groups. Each group held its own luncheon at Michigan Union, followed by its own program. The subjects presented at the various group meetings are listed on page 686, and abridgments of many of these papers and some of those given at the general sessions will appear in this and succeeding issues of this magazine under "Convention Papers . . . Abridged."

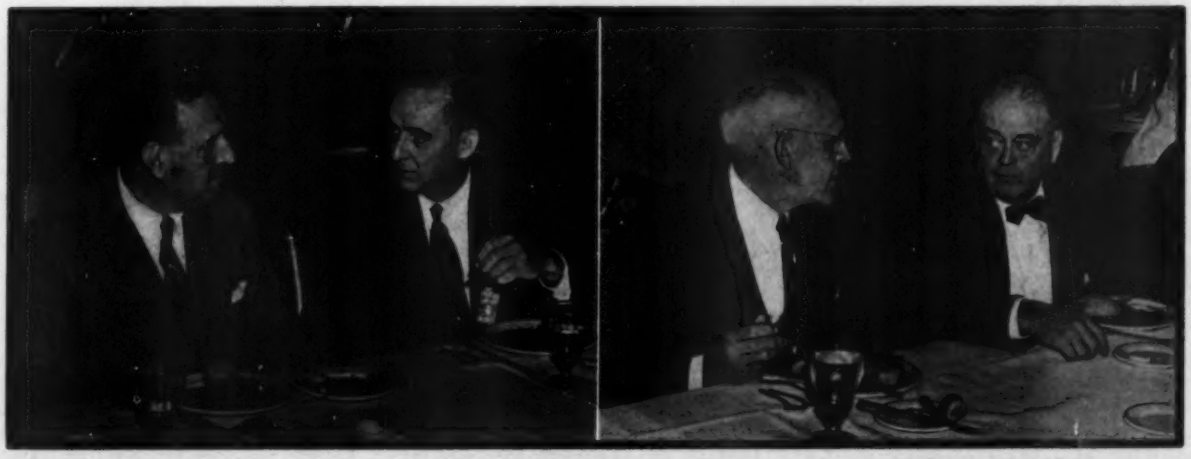
▶▶▶ Special luncheons were held each day for the women in the ballroom of the Michigan League Building, which is the center of women's activities on the campus. These luncheons were delightful social events, with a chemist's wife from Wisconsin sitting next a lady whose husband was a paper mill manager down in Maine. But following the thread of conversation at these luncheons, it was quite noticeable that the women in the technical men's families are giving serious consideration to subjects that are so important to their men—subjects that deal with problems that are already affecting the lives of their families. They are trying to understand all of the aspects, socially and economically, because as one speaker so aptly put it "the conflict going on in the world today is not a war between nations; it is a battle between two ways of life."

One luncheon on Wednesday was held in the ballroom of the Michigan League Building and was veritably a General Interest Meeting. There were tables for the ladies and tables for the men, and the attendance was probably the largest of any luncheon meeting during the convention. The drawing interest at this luncheon, which was

R. A. HAYWARD
Vice president of TAPPI, and general chairman of the Convention.

presided over by Mrs. Samuel T. Dana, wife of the Dean of the College of Forestry of the University, was the address which followed given by Dr. O. R. Yoder, medical superintendent of the Ypsilanti State Hospital, Ypsilanti, Michigan. Dr. Yoder delivered a most inspiring address on "Keeping Your Balance." He sketched several touching incidents drawn from his experience where patients had "lost their balance." And he stressed one thing: that during these times of stress and emotional strain, more than anything else we must keep our balance. We must realize above all things that "Christianity and democracy go together. . . . This simple faith is the most dramatic thing of all life, and it should be the primary one."

Basic subjects of particular interest to the technical men of the paper in-



LEFT—Virgil Jordan (left), president of the National Industrial Conference Board, and a guest speaker at the first general session of the Convention, talks with W. H. Swanson (right), president of TAPPI, at the Special Luncheon on Tuesday. RIGHT—Close-up of Prof. Ivan C. Crawford, dean of the University's College of Engineering (left), and Harry Fletcher, first president of TAPPI.

dustry were given special consideration by those who had come with questions and problems dealing with some of the methods of production, research or labor. But the climax of the entire convention came to a crystallization first on Wednesday afternoon, and again that evening, when a record attendance heard Norbert A. McKenna, Chief of the Pulp and Paper Section of the OPM, address the convention.

On Wednesday afternoon, Mr. McKenna participated in a round table discussion in the amphitheater of the Rackham Building. Also taking part in this discussion were: H. F. Taggart, assistant administrator, Office of Price Administration; and J. L. Riegel, president, and E. W. Tinker, executive secretary, of the American Paper and Pulp Association. This informal meeting was most helpful, and it gave many an opportunity to ask questions that had been perplexing.

▶▶▶ On Wednesday evening at the Lydia Mendelssohn Theatre, Mr. McKenna spoke, preceding the cavalcade, "Paper in Defense," on the subject of the "General Policy of the OPM." From his first appearance, Mr. McKenna's direct manner, and forceful statements evidenced a deep study of the industry's problems, and a clear, logical reasoning in working out solutions to those problems. He did not offer any glowing, easy method of adjustment to the complex situations that face the paper industry, as well as those that face all business, but he did express a definite conviction that the paper industry *could* meet all of the situations with which it is confronted —he very decisively stated that the industry is quite competent to put its own house in order; that it will not falter or hang back, thereby inviting government interference because of its failure to manage its own affairs. He most emphatically declared that **"The Decision Has Been Made,"** and whether we like it or not, we must cooperate to the fullest extent of our ability and our resources. Debate is entertaining; it is interesting, and often instructive, but in the present emergency, it is wasted. Certain issues have been recorded and all of the machinery at the disposal of the Government has been set in motion. With all of these decisions now made, the only thing to do is to seek the most efficient, the most productive methods that can possibly be put into practice that we may emerge triumphant from this chaos.

NORBERT A. McKENNA
Chief of the Pulp and Paper Section of the OPM (OEM Def. photo).

The beautiful Michigan League Building, center of women's activities at the University, was also the general center for entertainment of the ladies attending TAPPI convention. The Lydia Mendelssohn theater, where stage productions were given, is located in this building.

Touching on supply and demand, Mr. McKenna stated that next year's demand for paper is estimated at 26,000,000 tons. With the country's productive capacity (including Canadian newsprint) at only 21,000,000 tons, there will be a shortage of approximately 5,000,000 tons. This estimate is based upon civilian, defense and indirect defense consumption.

There were no evening meetings. There was dinner and dancing each evening in the Ballroom at Michigan Union. These were most enjoyable affairs and offered pleasant and entertaining interludes between the day's activities and the events scheduled for each evening.

Following dinner on the first evening of the convention, the guests remained in the Ballroom to hear a broadcast from Detroit. R. A. Hayward, general chairman of the convention, had hurried to the nearby city to speak over the radio from the Detroit Sulphite Pulp and Paper Company, where "The Defense Reporter," a regular program sponsored by the National Association of Manufacturers, was being broadcast.

Later that evening, perhaps the gayest party of the convention was put on with Carnival Night. This frolic offered a good time for everyone and most of those at the convention participated in the fun.

▶▶▶ Paper has become so much a part of our way of living that it is taken for granted many times each day in countless forms. One of the most outstanding productions ever put on at a convention was the extraordinary cavalcade, "Paper in Defense," given in the Lydia Mendelssohn theatre at the Michigan League Building Wednesday evening. This stage production was put on by a large number of employees of the Kalamazoo Vegetable Parchment Company, Kalamazoo, assisted by the Kalamazoo Civic Players. The script was written by Glenn Stewart and M. Dale Ogden, of the KVP Company, and Paul Staake, of Staake and Schoonmaker, Kalamazoo. M. Dale Ogden was commentator, and there were nine scenes, each dramatizing an event in our defense program with

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It clears flakes from coated book broke using 40 H.P., and handling 2400 lbs. per hour (replacing a larger Jordan, 150 H.P. motor handling same volume).

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Builders of Quality Machinery for Paper Mills

Now and then around the edge of a group, it was possible to get one or two delegates in range of a camera. Left to right are: Dr. D. W. McCready, of the University staff, who was one of the vice chairmen of the convention; R. G. Macdonald, secretary-treasurer of TAPPI; J. L. Hayes, technical director, Bemis Bag Co. (Peoria); Linton Edgerly (left), Watab Paper Co., and B. F. Stahl, Terre Haute Paper Co.

paper as the main theme. All of the characters were in costume, and each one took his part in a most professional style. The stage effects, the music by the young draftee and The Parchment Quartette, added to the color of a "First Nighter" performance.

A leading part in the production was nobly done by Glenn Stewart, who, as Benjamin Franklin, enacted that part in the scene "Freedom of the Press." The Poor Richard philosophy written into the monologue delivered by Mr. Stewart brought to mind the quotation, "With twenty-six soldiers of lead I have conquered the world." *(Of French origin. Author unknown. Time, probably the early part of the seventeenth century.)* Reflection on this subject brings one to a realization that the battle of the graphic arts was won on a field of paper — without paper there would be no such thing as our cherished "freedom of the press." (Mr. Stewart's monologue is reproduced on page 684.)

The Kalamazoo Civic Players also gave a splendid performance on Thursday night when they played "The Male Animal" on the stage of the Lydia Mendelssohn theatre.

▶▶▶ Although schedules were filled to the limit, a goodly number of golfers could not resist the opportunity to try the University golf course. Prizes were presented to the winners at the dinner on Wednesday night. A new feature was added to the golf program at this convention when the various sections of TAPPI competed with each other. The Pacific Coast Section carried off the honors for this, the first event of its kind.

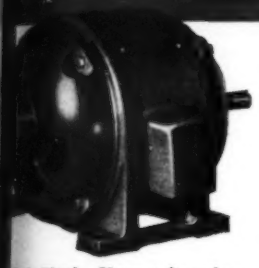
On Thursday afternoon the women had the thrilling experience of listening to an informal address, illustrated with motion pictures, by Dr. Elzada U. Clover, instructor in Botany, and assistant curator in the Botanical Gardens at the University. Dr. Clover holds the distinction of being the sponsor of an expedition which, in 1937, passed safely through the Grand Canyon of the Colorado. Until her party, consisting of two women and four men, shot the rapids, no woman had come through alive. Dr. Clover's expedition was the search for cacti. It was difficult to realize that this modest, scholarly woman, who said as she spoke that "she was not very courageous," was the same one shown in the motion pictures, where they fought those deadly rapids through to safety. The three boats that carried them through were especially constructed of Douglas fir, and it seemed quite miraculous that all six in the party came through that experience, bringing out equipment and motion pictures.

The day following the close of events at Ann Arbor, many went on a delightful excursion to the Ford plant and Greenfield Village, at Dearborn, Michigan, with lunch at the well-known Dearborn Inn.

And so TAPPI took a postgraduate course and went home with a Degree of Understanding gained by learning much of life and business as it is today that will be valuable to them as individuals and to their companies.

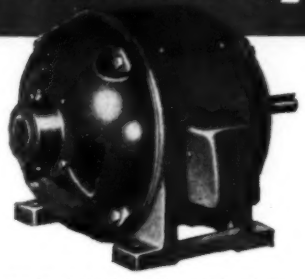
Four good fellows get together and chat a while in the sunshine before one of the morning sessions. Left to right: W. W. Galloway, Bauer Bros. Co.; Pierre Drewsen, Hinde & Dauch Paper Co.; Harry E. Weston, Fritz Publications, Inc. and R. L. Eminger, secretary-treasurer of the American Pulp and Paper Mill Superintendents Association.

TRI-CLAD* protection is now a *family affair!*



Tri-Clad Sleeve-bearing Polyphase Industrial Motor Is Most Widely Used

A well-protected, open motor for industry's general-purpose needs. Horizontally mounted—for direct-connected and belt drives—it is economical to operate.



Tri-Clad Ball-Bearing Polyphase Motor

Has additional advantage of being mountable in other than horizontal positions. Will take end thrust—for example, from beveled-gear pinion. Similar to the sleeve-bearing motor and, like it, available in many types.

Tri-Clad Splashproof Ball-bearing Polyphase Motor

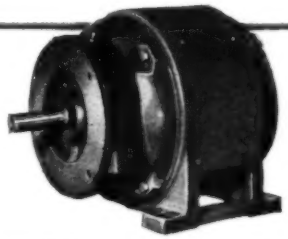
For use in wet surroundings, such as dairies, paper mills, canning factories, etc. Furnished with cast-iron, waterproof conduit box, deflecting endshields, and moisture-resistant insulation.

Tri-Clad Capacitor-Motor (in sleeve-bearing or ball-bearing types)

For single-phase operation. Available in types to drive such devices as compressors, pumps, fans, blowers. No radio interference; no brushes to wear; quiet in operation.

Tri-Clad Gear-Motor

For economical, compact, low-speed direct or pinion drive. Wide range of output speeds available. Open, splashproof, and capacitor-motor construction. Oil- and dust-tight housing reduces maintenance. Easy to mount.



Tri-Clad Ball-bearing Induction Motor, with Face-type End-shield Mounting

For close-coupled attachment to machine tools, compressors, pumps, etc. Motor bolted from driven machine. A few standard mounting dimensions apply to many ratings.

Tri-Clad Round-frame, Ball-bearing Induction Motor with Flange-type End-shield Mounting

For close coupling, for direct bolting to driven machine. Mounting dimensions are standard, but larger than those of motor at left.

Tri-Clad Vertical Motor

For general purpose fan, pump, and machine drives in vertical position. Both polyphase and capacitor-motors available with solid- and hollow-shafts and shielded construction with a variety of bases.

The improvements in Tri-Clad motor design are *fundamental* improvements, not just "sales features" to popularize a new model. That's why they are being extended, month by month, to a whole family of G-E integral-horsepower motors—both general-purpose and special types.

All these new members of the Tri-Clad family are the result of basic redesign to meet modern industrial conditions. Each has new performance and convenience features important to its particular field of service. For complete information on the right Tri-Clad motor for your application, consult our local office, or write General Electric, Schenectady, N. Y.

BUILT FOR PROTECTION FIRST . . . TO LAST

Today a wider range of your special needs can be filled by the growing Tri-Clad motor family. Every member offers extra strength and longer life because of these 3 "extras"

- ***Extra Protection*** AGAINST PHYSICAL DAMAGE. Cast-iron frame and end-shields.
- ***Extra Protection*** AGAINST ELECTRICAL BREAKDOWN. Stator windings of Formex wire.
- ***Extra Protection*** AGAINST OPERATING WEAR AND TEAR. New sleeve-bearing design.

In addition, you'll find the modifications to meet special requirements are soundly engineered to give you space-saving, time-saving, and money-saving advantages all down the line. Consult your G-E representative for Tri-Clad horsepower ratings now available.

*Reg. U. S. Patent Office.

GENERAL ELECTRIC

Group Sessions Held During the TAPPI Fall Meeting

Fundamental Research

Chairman—H. F. Lewis, Institute of Paper Chemistry

"Oxidation of Cellulose by NO_2—NO_2O_4," W. O. Kenyon, Research Laboratories, Eastman Kodak Co.

"Cellulose Cuprammonium System and the Presence of Pectin in Wood Pulp," T. A. Howells, Institute of Paper Chemistry.

"General Report on Holocellulose Research," G. J. Hajny and G. J. Ritter, Forest Products Laboratory.

"An Investigation of Spruce Thiolignin," G. Edward Ahlm, Institute of Paper Chemistry. (By title.)

Sizing

Chairman—F. L. Chappell, Jr., Sutherland Paper Company

"Behavior of Alumina in Relation to Sizing," B. W. Rowland, H. L. Davis and T. T. Collins, Jr., Institute of Paper Chemistry. (By title.)

"An Investigation of Rosin Size Precipitation and Its Effect on the Sizing and Strength Properties of Paper," W. P. Dohne and C. E. Libby, New York State College of Forestry.

"Urea Resins in the Pulp and Paper Industry," M. H. Bigelow, The Plaskon Company.

"Surface Sizing," J. P. Strasser, Stein-Hall Manufacturing Company.

Acid Pulping

Chairman—H. A. DuBois, Kimberly-Clark Corporation

"Pulping Loblolly Pine Heartwood with Calcium Magnesium and Sodium Base Sulphite Liquors," J. N. McGovern and G. H. Chidester, Forest Products Laboratory.

"Absorption of Sodium Sulphite Liquor by Sweetgum Chips," J. N. McGovern, J. N. Evert and G. H. Chidester, Forest Products Laboratory.

"Further Studies on the Desulphonation of Calcium Lignosulphonate," A. J. Bailey, I. A. Pearl and H. K. Benson, University of Washington.

Materials of Construction

Chairman—J. E. Lee, Managing Editor, *Chemical and Metallurgical Engineering*

"Metals Situation," A. E. White, Director of Department of Engineering, University of Michigan.

"Substitute Materials," Colonel G. Brady, Office Price Administration and Civilian Supply.

"Maintenance Coatings for the Pulp and Paper Industry," A. R. Olson, Hercules Powder Company.

"Mill Maintenance," Percy Tigwell, Beloit Iron Works.

Pulp Purification

Chairman—D. T. Jackson, Hammermill Paper Company

"The Relation between Bleachability Test Data and Other Pulp Characteristics," T. A. Pascoe and H. E. Nelson, Nekoosa Edwards Paper Company.

"The Use of Bleachability Tests in Marketing Pulp," Rex Vincent, Bulkley, Dunton Pulp Company.

"A Study of Bleachability Methods," B. L. Browning and G. D. Knight, Institute of Paper Chemistry.

"Some Observations on Loeschbrandts Method of Determining Oxidizable Materials," J. C. Tongren, Hammermill Paper Company.

"A Study of Replies from Questionnaires on Operating Control of Pulp Bleaching," J. D. Rue, Hooker Electrical Chemical Company.

Coating

Chairman—W. A. Kirkpatrick, Allied Paper Mills

"Evaluation of Methocel as an Adhesive for Paper Coatings," Myron Kin, R. M. Upright and F. C. Peterson, Dow Chemical Company.

"New Adhesive Economics in the Use of Calcium Carbonate," Howard F. Roderick, Michigan Alkali Company.

"Microscopic Observations of the Bonding Zone of Paper Coatings," Curtis R. Singleterry, Research Chemist with Glenn Davidson, Aurora, Illinois.

"Sorbital and Other Polyalcohols in Glue Coatings," H. C. Speel, Atlas Powder Company.

Biological Control

Chairman—Allen Abrams, Marathon Paper Mills

"A Program of Microbiological Research," J. W. Appling, Institute of Paper Chemistry.

"Experiences in Slime Control in Paper Mills," J. A. Holmes, National Aluminate Company.

"Microflora of Felts Slimes," Miss Olga Smith, Institute of Paper Chemistry.

Testing Methods

Chairman—J. d'A Clark, Institute of Paper Chemistry

"A Direct Method of Measuring Surface Roughness of Papers," M. Heinig and P. K. Baird, Forest Products Laboratory.

"Measurement of the Relative Stiffness in Bending of a Single Fibre," C. O. Seborg and F. A. Simmonds, Forest Products Laboratory.

"Stain Reactions of Pulps Exposed to Ultraviolet Light," John Graff, Institute of Paper Chemistry.

"Consistency Tests and Packing Characteristics of Pulp," A. H. Croup and E. W. Sampson, Hammermill Paper Company.

General Interest Meeting

Chairman—M. R. Bailey, Bulkley, Dunton Pulp Company

"Personality in Selling," Arthur Secord, University of Michigan.

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Water Conditioning . . .

(Continued from page 670)

Since backwashing of the filters with cold raw water would not only result in the wastage of softened water, chemicals, and heat units but would also cause clogging deposits to form in the filter medium, backwashing is performed with hot, settled water. This is drawn off by means of a backwash pump, forced upwardly through the filter unit and back to the top of the settling tank being thereby recovered.

The filters are usually supplied in batteries of two or more filter units and these units are so designed that, when one unit is out for backwashing, the other unit or units of the battery can carry the full softening load. In this way, the soft water service is made continuous. Following the softening plant, various corrective chemicals, such as phosphate, may be employed, and these are often introduced directly into the boilers so as to avoid the formation of deposits in the boiler feed lines.

EDITOR'S NOTE: Part I of this article appeared in the September issue. Part III, the final installment, will appear in an early issue of this magazine.

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Trouble on the Paper Machine

(Continued from page 672)

well on any grade of paper that requires an even caliper. It is a poor winder, however, which, with a properly set slitter board and a well-calendered sheet, will cause trouble that cannot be detected easily.

Rolls on the *winder* will *run together* if spreaders are not provided to keep them apart. They also will run together if power to the winder is unsteady—the tension of the paper being released between the reels and the winder upon a slowing down of the winder due to faulty paper thus causing the rolls to run together.

EDITOR'S NOTE: This series will be continued. Previous installments have appeared as follows I—Fourdrinier Part in June; II—Press Section in July; III—Dryers in August; and IV—Calenders in September, 1941.

The NORWOOD ENGINEERING COMPANY
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NORWOOD STEEL PRESSURE FILTERS FOR INDUSTRIAL INSTALLATIONS
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HOW YOU CAN GET A GOOD START TOWARD
INCREASED PRODUCTION
YOU can get a good start toward increasing your production by starting at the beginning . . . with your process water.
You need plenty of good process water to make good paper in increased tonnage . . . and you can get plenty of good process water with ample Norwood Filters in good condition.
By doing a bang up job of filtration, Norwood Filters give you better process water . . . filtered at the maximum speed consistent with the quality you need.
Start at the beginning to increase production. Start now by checking up on your filter capacity and condition. Then put your problem up to Norwood's engineers . . . men with nearly half a century of filtration experience in the paper field.
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Get a Good Start And a Good Finish With
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Separate Air Wash System
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ANNUAL SAFETY CONGRESS

Enlists for Defense

▸▸▸ WITH THE NATION'S ACCIDENT RATE increasing, another vital part of the national defense program has demanded the attention of the President of these United States. The Chief Executive has seen the great need for a more intensive campaign against accidents in this time of emergency, in order that all defense work may be geared to high speed with the utmost safety.

A special national campaign for this cause, which is not only close to every citizen but a vital part of our national emergency, was put into operation when the President issued a proclamation asking the National Safety Council to enlist its nation-wide resources in an intensified campaign against accidents. It was fitting that the time set for this emergency measure should be the week of October 6, on which date the 30th Annual Congress of the National Safety Council opened in Chicago.

The Annual Meeting of Members, which is the opening session of this Congress—the world's largest safety event—sets the keynote for the many sessions that follow. This year it was especially impressive. It also was patriotic and truly American. The opening ceremonies and the addresses which followed were built around the theme of the Congress, "Help Defense—Stop Accidents." At the appointed time for the meeting the Ballroom of the Stevens Hotel was packed. Then down the center aisle marched the national American Legion champion drum and bugle corps of the Commonwealth Edison Company post. In full dress uniform, the corps marched to the platform and presented to Col. John Stilwell, president of the Council, the flags of the United States, the State of Illinois, the City of Chicago and the American Legion, and the Universal Safety Emblem. As the organ pealed "The Star Spangled Banner," the vast audience rose, after which Colonel Stilwell asked all present to raise the right hand and to take this pledge:

"I pledge my efforts to safety with increased devotion, that the full strength of my country may be sooner realized and its security maintained."

Colonel Stilwell, who has been president of the National Safety Council for the past two years, made a special plea during his opening address to the Congress that each one present enlist individually or through other safety organizations and groups in a new and intensified campaign for more reduction in accidents of all kinds.

Following are highlights of four things Colonel Stilwell states can be done, and *must* be done in this emergency:

First—Let each of us exercise a more dynamic leadership for safety in his own company, city, state—in all his business and personal contacts . . . .

Second— . . . In these extraordinary times, it is not enough for us merely to keep on doing what we have been doing all the time. . . . But we also must recognize the new problems which the emergency has created or magnified, in industry, on the highway, and elsewhere. . . .

Third—We must mobilize all our strength to defeat the strong pressure for diversion of safety budgets and manpower to other uses. . . .

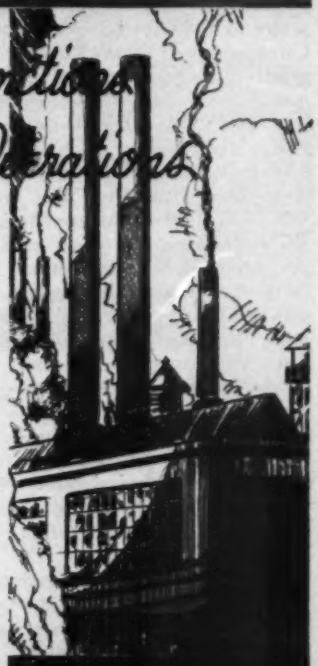
Fourth— . . . This emergency throws into bold relief one aspect of our work, always vital, but sometimes overlooked—that our National Safety Council and the entire safety movement rest on the foundation stone of *co-operation.* If we need national unity in the world crisis, equally do we need a united front in the war against accidents.

The first speaker at the Annual Meeting was B. C. Heacock, chairman of the executive committee, Caterpillar Tractor Company, Peoria, Illinois, and assistant to the Under-Secretary of War, Washington, D. C. Mr. Heacock's subject was "The Value of

The colors were presented at the opening of the Thirtieth Annual Safety Congress.

LUNKENHEIMER VALVES

Perform important service functions in support of Defense Operations



It's quite natural when thinking of Defense to picture large plants — thousands of machines — and legions of men all busily engaged in the production of munitions, tanks, armored tractors, ships, airplanes and similar war units.

Let's peek behind the scenes at the Power Plants, furnishing the energy for all this defense work. Here, where countless valves control the power that keeps these factories humming, lies a distinct responsibility for maintaining uninterrupted production. Here the selection of the correct valve for the job takes on new values — stamina to stand up over long periods without failure — simplicity of design that insures ease of repair — pretested construction that insures constant service without frequent replacement.

Correctly engineered, rugged Lunkenheimer Valves are a "natural" for this important defense service. The accurate machining of vital parts eliminates excessive wear — reduces maintenance — provides longer life — insures continuous satisfactory service — all distinct aids in maintaining high production in hard-pressed plants.

Thus, in serving industry *better*, Lunkenheimer is helping to conserve both power and materials in the "all out" production for defense needs, and you're helping, too, when you use Lunkenheimer Valves.

Your Lunkenheimer distributor is cooperating in every way to give you the kind of service you so vitally need for the National Defense Program. His facilities will save you time and trouble.

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Safety to Industry and the Country," but he reversed the subject and approached it from the negative. The title substituted was "The Value of our Carelessness to Our Enemies." The speaker then asked "When does carelessness blend into unintentional sabotage—even into something approaching, in effect, treason?" A startling approach to the subject, yes, but, as Mr. Heacock stated, none too severe to indicate the "Value of Our Carelessness to Our Enemies." He urged a "Crusade against Carelessness." And since carelessness causes accidents, if we attack the cause, safety will be the result.

The second subject covered at the Annual Meeting was "The Nation's Job—Guarding its Manpower." This stirring address was given by Senator Alexander Wiley (Wisconsin). The Senator addressed the gathering by calling them "social engineers." He stated that our greatest need for defense is manpower for our armed forces, and manpower for our productive forces. . . . We know that today battles are won or lost in factories. The battle of production is on. In that battle, technical safety experts are standing in the front lines with government officials to effect a conservation of manpower.

The annual banquet is always an enjoyable occasion. It brings together delegates from all sections and the speaker usually is a headliner. This year the banquet was held on Wednesday evening in the Grand Ballroom of the Stevens Hotel, and the large gathering had the pleasure and privilege of listening to a stirring address by the Hon. Frank Knox, Secretary of the Navy, Washington, D. C. Announcement also is made at the banquet of the election of the National Safety Council's president for the coming year. It was with great enthusiasm that those present learned of the re-election of Colonel Stilwell as president for another year. This is the third consecutive year he has been made president.

PAPER AND PULP SECTION

▶▶▶ Even with most of the paper mills beset with problems such as priorities, labor turnover caused by the national draft, etc., a large delegation greeted General Chairman D. B. Chant when he called the first session of the Paper and Pulp Section to order on Monday afternoon. In his annual report to the Section, Mr. Chant stated that the total net gain for the past year had been six new members, and that the Section now enjoys the largest membership it has ever had. He thanked the officers and committees that have worked with him during the past year, and voiced a deep appreciation of the Section and himself for the co-operation and help given by the National Safety Council staff.

Colonel John Stilwell, who was elected president of the National Safety Council for the third consecutive term.

The "Review of 1940-1941 Paper and Pulp Accident Experience," was presented by F. W. Braun, vice president and chief engineer Employees Mutuals, Wausau, Wisconsin, and chairman, Statistics Committee of the Section. Mr. Braun's report cited statistics to show the progress of accident prevention in the paper industry since 1926. Accident frequency has been reduced 70 per cent in 14 years. In more recent years, the downward trend has been reversed, he reported. Working time in the paper industry has been increased about 10 per cent, but accident severity has increased 38 per cent in the past two years.

Mr. Braun recommended a greater use of accurate and detailed records to detect the causes of accidents and to permit placing responsibility. He brought out that sometimes an accident is repeated several times annually without attracting sufficient attention to be investigated.

The second speaker on the Monday afternoon session was R. B. Robertson, Jr., vice president, Champion Paper & Fibre Company, Hamilton, Ohio. Mr. Robertson spoke extemporaneously, and his talk was illustrated with a large number of charts, graphs, and exhibits of safety literature, magazines, etc., which were mounted on a large board on the speakers platform.

The subject covered by Mr. Robertson was "Accident Control as a Phase of Operation in the Paper and Pulp Industry." The speaker analyzed the subject thoroughly and comprehensively. In the very beginning he stated that one of our main problems is to keep safety on the "must" list. He outlined four important points to be considered in solving this problem:

First—Our problem is to have management realize there *is* a problem.

Second—Management must formulate a plan to attack that problem.

Third—Management must organize to execute that plan.

Fourth—Management must persistently follow up to see that the plan is being carried out.

The speaker laid particular emphasis on placing the responsibility for accidents, and he outlined the function of the safety department and the place it occupies in the structure of company organization. He said that safety is a never-ending sales program. In order to get "all-out" defense efforts, it is our responsibility to aid with an "all-out" safety drive.

On the afternoon of the second day of the Congress, the Paper and Pulp Section divided its session and met jointly with two other groups—Paper Products and Pulpwood Loggers.

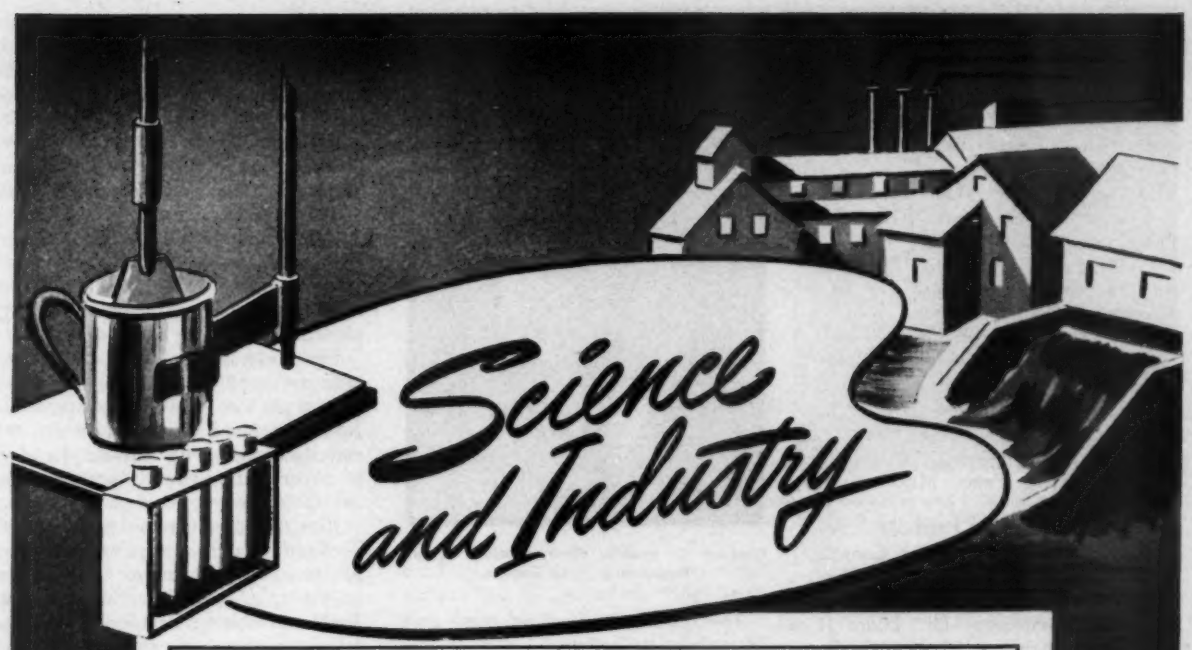
Presiding at the Paper Products-Pulp and Paper Section, was J. W. Kuebler, safety chairman, Personnel Department, Dixie-Vortex Company, Easton, Pennsylvania, and chairman of the Paper Converter Products Committee, Paper and Pulp Section.

The address at this session was on the subject "Safety in the Manufacture of Paper Products," given by M. L. Cashman, district engineer, Liberty Mutual Insurance Company, Chicago. Considerable discussion took place following Mr. Cashman's address, and many interesting questions and comments were given from the audience. This discussion was ably led by J. Fred Berry, personnel manager, Alton Box Board Company, Alton, Illinois.

The session devoted to Paper and Pulp-Pulpwood Loggers was presided over by J. E. Cantin, safety director, Quebec North Shore Paper Company, Baie Comeau, Quebec, Canada. There was no special speaker at this session, but the subject "Safety Problems in Pulp Wood Logging Operations," drew interesting and constructive short talks from several present, with questions and informal discussion.

New Officers

The latter part of the session on Monday afternoon was devoted to a report of the Nominating Committee followed by election of officers. The slate of new officers for the coming year was accepted, and those elected to serve are:



Science and Industry

FOR MANY YEARS the paper industry has recognized the importance of chemical knowledge combined with technical skill in its approach to manufacturing problems. Consequently, these are now undertaken on a more scientific basis than ever before.

Color application is a science, and due to the many factors affecting its success, chemical knowledge and technical skill indispensably complement practical experience. Through painstaking and extensive research, chemical and dyestuff manufacturers have assisted in improving and simplifying dyeing and processing techniques.

Du Pont welcomes the opportunity to meet the ever-increasing demand for dyes capable of withstanding new treatments in the manufacture and processing of paper and allied products. Technicians in the many Du Pont laboratories are constantly studying the scientific and practical aspects of the industry's application problems. Their specialized training and experience enable them to cope with the complexities surrounding the application of color and render assistance in selecting dyes and adopting methods which will best meet specific requirements. As a result the paper industry has a wealth of technical information at its command.

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Organic Chemicals Dept., Dyestuffs Div., Wilmington, Del.

General Chairman — Clayton O. Braatz, Marathon Paper Mills Co., Rothschild, Wis.

Vice Chairman in Charge of Membership—Roland W. Richardson, The Gardner-Richardson Co., Lockland, Ohio.

Secretary and Program Committee Chairman—J. Fred Berry, Alton Box Board Co., Alton, Ill.

News Letter Editor—L. R. Simpson, The Brown Paper Mill Co., Inc., Monroe, La.

Committee chairmen elected to serve for the ensuing year are as follows:

Contest Committee — A. Scott Dowd, Fritz Publications, Inc., Chicago.

Data Sheet Committee—B. J. McClosky, Hoberg Paper Mills, Green Bay, Wis.

Engineering—Safe Practices Committee—Julius A. Draper, Consolidated Paper Corp., Ltd., Grand 'Mere, P. Q.

Health Committee—Dr. Louis H. Frechtling, Champion Paper and Fibre Co., Hamilton, Ohio.

Statistics Committee — Fred W. Braun, Employers Mutuals, Wausau, Wis.

Safety Instruction Card Committee —R. W. Croucher, Minnesota and Ontario Paper Co., International Falls, Minn.

Visual Education Committee — H. P. Heubner, The Flintkote Company, New York, N. Y.

LUNCHEON

One of the most enjoyable events scheduled for the Section each year is the Paper and Pulp Luncheon. This year approximately 100 gathered in the South Ballroom of the hotel for this annual get-together. Chairman Chant announced that the attendance registered at the Section this year represented seventeen states and three Canadian provinces. Also that the State of Wisconsin topped the list in the number of delegates.

Following the luncheon the Chairman called upon A. Scott Dowd, chairman of the Contest Committee, to give the data on the annual contest which closed June 30. Mr. Dowd read the following report:

Data on the Contest

▶▶▶ The Paper and Pulp Section has now completed ten of its consecutive annual 12-month safety contests. Previous to these, there were five annual contests, each of six months duration. Therefore, there has been an accumulated experience of fifteen years effort on the part of mill members of the Paper and Pulp Section to lower accident frequency in this industry.

Clayton O. Braatz, chairman-elect of the Paper and Pulp Section.

The historical review of these past fifteen contests exhibits a drop in frequency rate from 33.51 in the year 1927, to 14.32 in the year 1941. In the summary of accident rates for 1940, published by the National Safety Council, it is stated that since 1926 the paper industry has made cumulative reductions of 70 per cent in frequency and 57 per cent in severity, and that these improvements exceed the averages of all industries.

Participation in the Paper Industry Safety Contests has increased steadily since 1931 to the high mark in the 1940-41 Contest of 180 mills and plants, covering 92,016 employees who worked 184,039,939 man-hours during the year.

The average frequency rate for all participants in this latest competition was 14.32. While this is a little higher than the rates of the three previous years, it is slightly lower than the average frequency rate of the past ten annual contests, which is 14.67.

Paper and pulp mills had higher frequency rates in the 1940-41 Contest, averaging 14.49, against 12.75 for paper and board re-manufacturing plants.

Frequency rates of identical contestants averaged one per cent above the average in the 1939-40 competition. Rates increased 12 per cent in re-manufacturing. Only Groups *A* and *C* of paper and pulp mills were successful in improving their rates.

Eleven contestants finished the 1940-41 Contest with perfect scores. Two of these were in Group *C;* six were in Group *D,* and three were in the Re-Manufacturing Division. The highest man-hour exposure among the perfect scores was 495,675. This record was made by the Jonquiere, Quebec, mill of *Price Brothers & Co., Ltd.,* which finished first in Group *C.*

Some facts regarding the activities and accomplishments of the group winners in the 1940-41 Contest are both interesting to note and complimentary to these units that have achieved such excellent results in improving their accident records.

GROUP A

The *Wayagamack Division of Consolidated Paper Corp.,* Three Rivers, Quebec, has made remarkable improve-

Chairman Chant gives opening address at the first meeting of the Paper and Pulp Section.

ment in their accident records of the past five years, and reached the top of their group this year with a frequency rate of 1.36 covering 2,199,624 recorded man-hours. This mill manufactures kraft pulp and paper, groundwood pulp and newsprint. Their main approach to Safety has been to engender pride and "esprit-de-corps" among all the workers. This mill won the Group *A* trophy in 1932, during the time when it worked 343 days without a lost-time accident.

GROUP B

The *P. H. Glatfelter Company,* Spring Grove, Pennsylvania, manufacturers of soda pulp and paper, has by a well coordinated safety activity reached the top of their group this year with a frequency rate of 1.78 covering 1,122,804 recorded man-hours. Management of this mill thoroughly believes that individual and group morale are just as important in the prevention of accidents as training and the use of safety devices. Since conditions in the home greatly affect morale, the entire community of this small mill town of 1300 people is included in the safety program. Classed in the activity is a continuous contest between the various mill departments. Last August, three departments of the mill entered upon the 123rd month without an accident.

GROUP C

The mill of *Price Brothers & Co., Ltd.,* Jonquiere, Quebec, entered the 1940-41 competition as their first participation in our annual contests. Producing groundwood pulp, board and paper specialties, this mill operated 493,675 man-hours through the entire period of the Contest without a lost-time accident, and up to August 25th had a perfect score for 560 days.

The *Harriman Division of The Mead Corporation,* Harriman, Tennessee, manufacturers of semi-chemical chestnut pulp, tannic acid, and corrugating paperboard, has operated 365,390 man-hours through the entire period of the 1940-41 Contest without a lost-time accident. While the Harriman mill has had years of excellent safety accomplishment, this is the best Contest record it has made since 1936, when the mill won the group trophy with a perfect score in the 12-month period ended June 30th of that year.

GROUP D

The *Phillipsdale, R. I., mill of Bird & Son, Inc.,* has again made a perfect score, recording 331,556 man-hours. It is interesting to note that this mill which manufacturers roofing felt has made the best record of any of the company's plants. It went practically 4½ years, or 1735 days, operating a total of 1,420,095 man-hours from June, 1934, to December, 1938, without an accident. The major Contest trophy was awarded to this mill in 1937.

R. B. Robertson, Jr., spoke at the opening session of the Paper and Pulp Section on "Accident Control as a Phase of Operation in the Paper and Pulp Industry."

The *Nashville, Tenn., Division of The Mead Corporation,* manufacturers of semi-chemical chestnut pulp and corrugating board, has finished the Contest with a perfect score, covering 184,474 recorded man-hours. It has thereby completed five consecutive years—a total of 793,527 man-hours, without a disabling injury. Safety in this mill is maintained through personal contacts with every employee, to whom Safety is mentioned at least once every week. This is supplemented with bulletin boards changed regularly, black boards throughout the mill showing the current Safety record, Safety Sweepstakes, etc.

Continuous perfect scores have now been recorded in the past three contests of our Section by the following mills:

U. S. Gypsum Company, No. Kansas City, Mo. 553,209 combined man-hours.

Milton mill of *Spaulding Fibre Co.,* No. Rochester, N. H. 550,110 combined man-hours.

Hayes mill of *Spaulding Fibre Co.,* No. Rochester, N. H. 232,818 combined man-hours.

The *Central Fibre Products* mill at Vincennes, Indiana, finished the 1940-41 Contest with a perfect score, covering 157,656 recorded man-hours. The mill completed up to that time 560 days without a lost-time accident. This record leads the six mills in "Safety," operated by Central Fibre Products Company.

DIVISION II

Bay West Paper Co., Green Bay, Wis., manufacturers of tissue paper products, has finished each of the past four annual contests with a perfect score, having operated a total of 389,702 man-hours without a lost-time accident.

Bird & Son's Chicago roofing plant has again joined the family of perfect

At the general luncheon the first day of the Congress, members of the Executive Committee of the Paper and Pulp Section had their first real get-together.

HISTORICAL REVIEW OF THE PAPER INDUSTRY ANNUAL SAFETY CONTEST

Year	No. of Mills	No. of Man-Hours	No. of Employees	No. of Reportable Injuries	Frequency Rate	No. of Employees per Injury	Mills with Perfect Records
1940-1941	180	184,039,939	92,016	2,635	14.32	35	11
1939-1940	175	164,620,962	77,128	2,197	13.35	35	10
1938-1939	163	133,034,656	64,178	1,705	12.82	38	12
1937-1938	145	116,896,797	53,622	1,603	13.71	33	7
1936-1937	139	123,611,911	56,470	2,015	16.30	28	7
1935-1936	130	100,491,110	45,915	1,517	15.10	30	14
1934-1935	110	86,867,184	42,378	1,439	16.57	29	12
1933-1934	105	71,436,322	34,132	1,402	19.63	24	6
1932-1933	98	60,772,518	34,709	829	13.64	42	11
1931-1932	131	74,569,954	32,454	1,044	14.00	33	9
1931*	125	48,715,543	39,796	787	15.74	52	15
1930*	124	47,343,549	36,153	986	20.83	37	11
1929*	123	49,776,515	36,916	1,311	26.34	27	6
1928*	122	47,673,816	36,357	1,355	28.42	27	8
1927*	119	43,802,804	33,786	1,468	33.51	23	6

*Contest period January 1, to June 30.

scores, having operated 293,448 man-hours. This plant previously made a perfect record in the 1937-38 Contest.

Bird & Son's roofing plant at Shreveport, La., has now participated in four consecutive annual contests of our Section and made their first no-accident record in the 1940-41 competition, covering 161,477 man-hours.

These meritorious accomplishments are but a few citations of many other noteworthy cases of mills that have through their continuous efforts improved upon former accident experience.

No changes have been made in the rules for the 1940-41 Contest, and all participants in the contest which ended June 30, 1941, have been enrolled in the one which began on July 1st.

▶▶▶ The winners of group prizes having been announced through the reading of Mr. Dowd's report, Chairman Chant then introduced J. E. Long, superintendent of safety of The Delaware & Hudson Railroad Corporation, and a past president of the National Safety Council, who awarded, in behalf of the Council, the plaques and certificates won in each group. Winners of certificates were:

Group A

The Flintkote Company, Pioneer Division, Los Angeles, California.

Price Brothers & Co., Ltd., Riverbend Paper Mills, Riverbend, P. Q.

Group B

St. Croix Paper Company, Woodland, Maine.

Hoberg Paper Mills, Inc., Division "A", Green Bay, Wisconsin.

Group C

Strathmore Paper Company, Woronoco, Massachusetts.

Edward Benton Fritz Memorial Trophy

Throughout these ceremonies, suspense is heightened as the group trophies are awarded, for one of these winners is to receive the Edward Benton Fritz Memorial Trophy, awarded annually by Fritz Publications, Inc., to the group winner that has been found by a board of judges to have made the most outstanding safety record. This trophy is presented each year by Mrs. Fritz, widow of the founder of the magazine THE PAPER INDUSTRY AND PAPER WORLD, and vice president and treasurer of the corporation which now bears his name.

Following an introduction by Mr. Dowd, Mrs. Fritz was warmly welcomed by the Section. She reviewed briefly the purpose of the memorial to Mr. Fritz and the thought back of its presentation. She then announced that the trophy this year had been awarded to The Mead Corporation, Nashville, Tennessee, and P. Frank Winkeler, general manager of that plant, was quite moved with delight and surprise as he went forward and received the trophy from Mrs. Fritz.

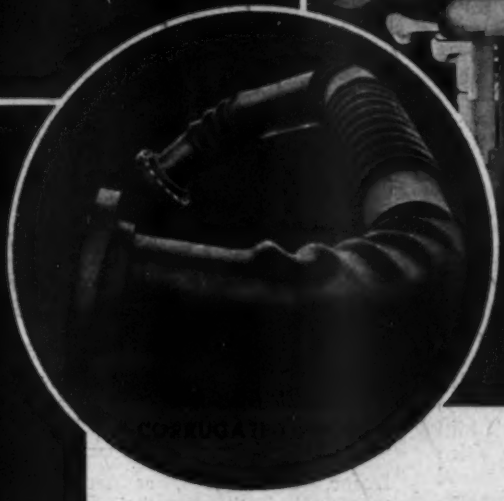
▶▶▶ Following the presentation, several matters were brought before the Section. Chairman Chant asked for a vote as to whether the Section favored fewer sessions, such as the program provided for this year, or whether the former practice of having more sessions was favored. The vote seemed about the same for either plan.

The retiring Chairman also introduced to the Section the Chairman-elect, Clayton O. Braatz, who spoke briefly. A solemn note was introduced when J. Fred Berry read a resolution on the passing of William J. Peacock, who was chairman of the Section for three consecutive years, 1926-1928 (See Necrology, page 704).

The last part of the program on Thursday afternoon was a brisk panel discussion with W. F. Cook, superintendent Personnel Department, Lakeview mill, Kimberly-Clark Corporation, Neenah, Wisconsin, presiding. Many questions on this safety exchange "What Would You Do?" were put to the panel consisting of: Mrs. Lillian Brewer, industrial nurse, Oswego Falls Corporation (Sealright Div.); D. T. Meany, safety supervisor, International Paper Company, Dalhousie, N. B.; L. R. Simpson, safety director, Brown Company, Monroe, Louisiana; and Ernest Dutcher, safety engineer, Flintkote Company (Pioneer Div.)

This panel discussion evoked enthusiastic participation of the large audience. A touch of reality was brought into the meeting when a Western Union messenger delivered a telegram to Walter Strong, personnel director, Marathon Paper Mills Company, Menasha, Wisconsin, asking what discipline should be meted out to an employee who had repeatedly disobeyed rules, and because of such carelessness had just suffered an accident. This brought up a wide discussion of disciplinary practices and methods from the unskilled worker up to the official.

Any delegate attending the sessions of the National Safety Congress takes home much from the meetings that is constantly coming to mind and giving help in developing safe practices or in solving certain problems. Thus these Annual Congress meetings continue to be of inestimable value throughout the year.



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ASSOCIATIONS

MICHIGAN DIV. SUPTS. ASS'N ELECTS OFFICERS

The Michigan Division of the American Pulp and Paper Mill Superintendents Association, at its annual meeting in the Park-American Hotel, Kalamazoo, Michigan, September 25, elected Henry Nendorf, coating room superintendent at the Rex Paper Company, as chairman for 1941-42, succeeding Arnold Weller, superintendent of the Sutherland Paper Company board division plant No. 1. Mr. Nendorf had been first vice chairman during last year.

Others elected unanimously following submission of the nominating committee's recommendations were: First vice chairman, Alfred Perlick, assistant superintendent of the Kalamazoo Vegetable Parchment Company's Mill No. 2; second vice chairman, Glen Sutton, superintendent of Sutherland Paper's standard division; and secretary-treasurer, Joseph L. Waber, Rex Paper Company chemist. Mr. Perlick last year was second vice chairman and Mr. Sutton was secretary-treasurer.

Two speakers at the meeting were S. A. Staege, Black-Clawson Company, Middletown, Ohio, and John Cornell, of *Paper Mill News*. Mr. Staege explained the mechanics of his company's recently developed simplifier screen and Mr. Cornell discussed the industry's prospects for next year.

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N. Y.-CANADIAN DIVISION SUPTS. ELECT OFFICERS

J. Wesley Youngchild, Glens Falls, New York, manager of the Fort Edward mill of the International Paper Company, New York, was elected chairman for 1942 by the New York-Canadian Division of the American Pulp and Paper Mill Superintendents Association at the September 13 session of the annual convention at the Sagamore Hotel, Bolton Landing on Lake George, New York.

H. E. Karberg, Merriton, Ontario, Canada, formerly second vice chairman, was advanced to first vice chairman, succeeding Mr. Youngchild. H. D. Cook, Phoenix, New York, was elected second vice chairman and William Duncan, superintendent of the Union Bag and Paper Corporation mills, Hudson Falls, New York, was made third vice chairman.

Mr. Youngchild appointed Foster P. Doane, Glens Falls, as secretary-treasurer of the association. Mr. Doane succeeds George W. Hill in this position.

The business meeting was followed by a golf tournament at the Sagamore Golf Club for members of the association, and a bridge tourney for the ladies. Prizes were awarded at a banquet on Saturday evening, which was followed by a dance.

Gus R. Holm, Canastota, chairman of the committee on arrangements for the convention, said that many compliments had been received on the selection of Lake George for the annual meeting place.

J. Wesley Youngchild

New officers of the Michigan Division of the American Pulp and Paper Mill Superintendent's Association. Left to right: Alfred Perlick, Kalamazoo Vegetable Parchment Company, first vice chairman; Glen Sutton, Sutherland Paper Company (Standard Div.), second vice chairman; Joseph L. Waber, Rex Paper Company, secretary-treasurer; and Henry Nendorf, Rex Paper Company, chairman.

NPTA HOLDS OPEN INDUSTRY MEETING

A record crowd of over 400 members of the National Paper Trade Association attended the Open Industry Meeting at the fall convention on September 15, at the Stevens Hotel, Chicago, and heard Norbert A. McKenna, chief of the Pulp and Paper Section of the OPM, discuss the problem of an estimated shortage of 5,000,000 tons of paper products in 1942. The convention lasted through September 17 with an exceptionally good attendance at all of the meetings. Complete and colorful exhibits were displayed by 48 paper companies.

Mr. McKenna, in the address opening the session, stated that to overcome the predicted shortage of 5,000,000 tons of paper during 1942, the industry must stress conservation and efficiency on the using side and also reduce the amount of pulp going into the same amount of paper as a solution to the problem.

Mr. McKenna further said that the total demand for paper in 1942 would be approximately 26,000,000 tons, and by using every available piece of equipment and operating at capacity the country would be able to produce 21,000,000; a shortage of 5,000,000 tons or 23 per cent.

Although the seriousness of the situation and the demand for immediate action were stressed by Mr. McKenna, he expressed his belief that the industry itself had the power to organize and cope with the problem of

Mutilated

equalizing the supply and demand. Along this same line, it was stated that the Government does not want to interfere but rather wants to act as a general staff in an advisory capacity and keep the amount of dislocation at a minimum.

Following the same theme, that he thinks the administration should be dealt with by industry itself and without interference from the Government Mr. McKenna offered the first step in the new program: He appointed an advisory committee, of ten members, to discuss the various problems confronting the industry and submit their conclusions to the OPM in three weeks. This committee met on September 17 at Chicago and elected R. C. Kettels chairman and W. N. Gillett vice chairman.

In conclusion Mr. McKenna said, "Just tell us what to do and we will conduct ourselves to protect you—We appeal for 100 per cent co-operation, which I am sure will solve the problem."

At the same session Walter C. Shorter, assistant to the Director of Purchases, of the OPM, discussed the needs and problems met with in obtaining paper supplies for the various governmental departments. It was also Mr. Shorter's contention that by being far-sighted and exerting every ounce of co-operation the paper industry would be able to avoid governmental interference and take care of the situation in its own way.

This opening meeting was presided over by Perry W. Lesh, President of the National Paper Trade Association, who in his remarks on the talks by Mr. McKenna and Mr. Shorter stated that he thought he was speaking for the entire industry when he said, "We will exert every effort to take care of this situation by giving our full co-operation to the OPM."

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Draper Felts Favor Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856 CANTON, MASS.

OUR REPRESENTATIVES *to serve you*

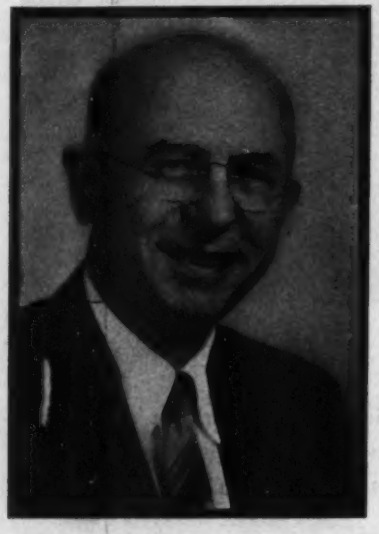
L. H. BREYFOGLE, Kalamazoo, Mich.
C. K. BEECHER, Delaware, Ohio
W. L. CAMPBELL, Savannah, Ga.
O. J. LELOFF, Vancouver, Wash.
RALPH E. BRIGGS, Canton, Mass.

ALLIED

TOM COLLORD HEAD OF NEW COATING CO.

A new company, Protective Coatings, Incorporated, Detroit, Michigan, has been established to meet one of the more acute problems confronting defense manufacturing. A complete line of products for the protection and preservation of materials used in manufacturing will be featured by the company.

This line is known as the Tocol line and the service includes complete rubber insulation as well as a line of more than 35 products for the protection of building structures, metals used in production and for the protection



H. Tom Collord

of many types of materials against the ravages of the elements—water, sun, acids, and alkalis—as well as general wear.

The leader in the line is Aquanil, a non-oxidizing waterproofing material, for concrete, stone, wood, brick, and metals. Others are Deox, a metal conditioner for all metals; Helfyr, a coating that resists temperature to 3000 Fahr. and used principally for refractory linings; and Volcazite which protects metals against all forms of corrosion.

Tom Collord will head the new company. Mr. Collord is well-known in the industry and has in the last few years co-operated with a group of industrial laboratories in the development of unique and serviceable protective coatings.

Mr. Collord is the founder of the firm, Collord, Incorporated, producer of rubberized production parts for the automobile industry, and also founder and president of the Paramount Rubber Service, Incorporated, a rubber insulating service organization.

The new company is now in production and is helping a number of industrial concerns to solve their coating problems.

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▶▶▶ APPROXIMATELY $300,000 will be spent by the Cornwall Chemicals, Ltd., Cornwall, Ontario, to construct a new plant for the manufacture of carbon bisulphide used in the manufacture of Cellophane and rayon. Formerly, this product was imported from the United States. The plant will be 150 ft. x 90 ft., one floor, and of brick and steel structure on concrete foundations. Operations are expected to be started the first of 1942.

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▶▶▶ A NEW ANNEALING FURNACE, especially designed by Ryerson engineers, has been installed in the steel service plant of the Joseph T. Ryerson & Son, Inc., Chicago. This new furnace, 24 feet long, can be divided into three sections, and each of the sections can be used as a separate unit. It is gas-fired and is lined with a special heat resisting material. Another outstanding feature of this new piece of equipment is the finger-tip control mechanism by which it is operated.

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▶▶▶ THE NEW TITANIUM MINING development of the National Lead Company in the Adirondacks at Tahawus, New York, will be placed in operation next summer if the current rate of construction continues, according to President F. W. Rockwell, who accompanied directors and officials on a recent inspection tour. The mine, which represents an estimated cost of $5,000,000, will produce ilemite from which titanium dioxide, a pigment used in the paper, paint, leather, rubber, and other industries is obtained.

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▶▶▶ A LARGE ADDITION to the factory of the Keystone Carbon Company, Saint Marys, Pennsylvania, has just been completed. The new building will be used for the manufacture of brushes and porous bronze brushes. This company has already laid foundation for another addition to the plant.

▶▶▶ EIGHT NEW STORAGE TANKS, adding nearly 250,000 gallons to the bulk storage capacity of the plant of National Oil Products Company, Harrison, New Jersey, have just been completed. These new 50-foot tanks, located on the Passaic River, will give the Harrison plant a total bulk storage of approximately 3,000,000 gallons.

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▶▶▶ PLANS ARE BEING DRAWN for a $100,000 addition to the assembly floor of the Cameron Machine Company, Brooklyn, New York. The increasing demand for the machinery manufactured has made this extension necessary. By this change the company expects to step up production to serve those customers being pushed by defense contracts.

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▶▶▶ DUE TO A LARGE INCREASE in business, it was necessary for the Wheelco Instrument Company, Chicago, to move to a larger building, located at Harrison and Peoria streets. This change is expected to bring about a 100 per cent increase in the personnel of both the factory and the offices of the company.

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▶▶▶ PLANS FOR A LARGE ADDITION to its plant were approved September 23 at a meeting of the Board of Directors, of Hills-McCanna Company, Chicago. It is expected that this expansion will practically double the present capacity.

◆

NORANDA MINES INTERESTED IN CAN. CHINA CLAY

Paper manufacturers have been interested in announcements that have been made from time to time regarding the activities of Canada China Clay, a new [illegible]

ARE YOU

USING THIS HISTORY-MAKING TURBINE OIL?

THERE'S no need to "put up" with a turbine oil that does only part of the lubrication job. Use the new Shell Turbo Oil—it's the *first* turbine oil to meet the 3 vital requirements of modern turbine lubrication . . .

RUST CONTROL

SUPERIOR OXIDATION STABILITY

MINIMUM FOAMING TENDENCY

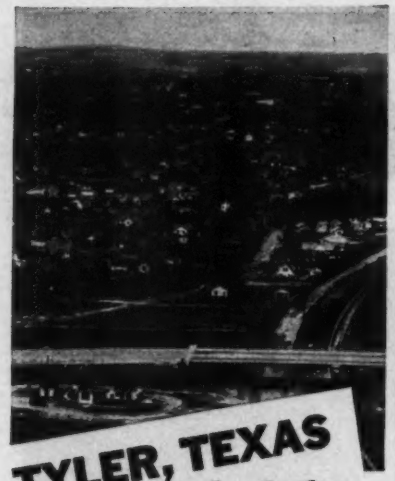
Why not give the turbines in your plant the benefits of this new lubricant? You'll find a Shell man's recommendations entirely practical—and made without obligation.

THE PROOF!

The 4 steel test strips shown prove that Shell Turbo Oil can prevent rusting. All 4 strips were immersed for 48 hours at 167° F. in 4 well-known turbine oils, mixed with 10% of distilled water and continuously agitated at 1200 R.P.M. Top strip, immersed in Shell Turbo Oil under these severe test conditions, shows no rust. All other strips were badly rusted.

SHELL

SHELL TURBO OIL



TYLER, TEXAS
City and Industry—
100% Layne

NUMEROUS are the cities and towns where municipal and industrial water wells and pumps are 100% Layne. The progressive and thriving city of Tyler, Texas, is an example. The first ground water development in that area was installed by Layne in 1934. Since then all municipal and industrial well water supply and turbine pump systems have been Layne.

In meeting defense and armament project emergencies, Layne Companies have broken all records, both in the number of wells and pumps installed and in the quantity of water produced, in any like period of time. In addition to such added activity, Layne Companies have continued their service to municipal and industrial non-defense projects without appreciable delay.

Layne is unquestionably the largest and most widely experienced ground water developing organization in the Nation. Their methods have proven most successful and the number of their completed projects exceeds that of any other organization ten times and more.

Layne has the men, machinery and experience necessary to handle water development contracts of any size. Their Engineers are ready to cooperate on your plans. If you need more water, write or wire.

LAYNE & BOWLER, INC.
Memphis, Tenn.

LAYNE
PUMPS & WELL
WATER SYSTEMS

AFFILIATED COMPANIES

Layne-Arkansas Co. ..... Stuttgart, Ark.
Layne-Atlantic Co. ..... Norfolk, Va.
Layne-Bowler New England Corp. ..... Boston, Mass.
Layne-Central Co. ..... Memphis, Tenn.
Layne-Northern Co. ..... Mishawaka, Ind.
Layne-Louisiana Co. ..... Lake Charles, La.
Layne-New York Co. ..... New York City.
Layne-Northwest Co. ..... Milwaukee, Wis.
Layne-Ohio Co. ..... Columbus, Ohio.
Layne-Texas Co. ..... Houston, Texas.
Layne-Western Co. ..... Kansas City, Mo.
Layne-Western Co. of Minnesota ..... Minneapolis, Minn.
International Water Supply ..... London, Ontario, Can.

SAFETY

FIRE CAUSES $20,000 DAMAGE AT OHIO PAPER CO.

Fire from an undetermined origin destroyed a storage building belonging to the Ohio Paper Company, Miamisburg, Ohio, on September 15, causing a $20,000 loss. Officials believe that a dust explosion or spontaneous combustion may have started the fire.

It was announced by the president of the company that a large amount of paper had been removed from the store house a few days before which made the loss considerably lower than it might have been. Plant operations of the plant will not be interrupted.

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▶▶▶ CONTEST SCORES on this page are for the second month of the contest which started July 1, 1941. During the annual safety congress which just met in Chicago, trophies and certificates were awarded winners of the annual contest which closed June 30, 1941. These presentations were made at the Paper and Pulp luncheon meeting (See page 688).

The Paper Industry Safety Scores

July 1, 1941 to June 30, 1942

Out of 184 mills reporting for August, 36 have perfect record

PERFECT SCORES
Division I—Pulp and Paper Mills

PARTICIPANT	MILL	LOCATION
GROUP A		
Marathon Paper Mills Co.	Rothschild	Wisconsin
GROUP B		
Rhinelander Paper Company	Rhinelander	Wisconsin
Kimberly-Clark Corporation	Niagara	Wisconsin
Rayonier, Inc.	Shelton	Washington
Hoberg Paper Mills, Inc.	Division "A"	Green Bay, Wis.
St. Croix Paper Company	Woodland	Maine
*Paterson Parchment Paper Co.	Bristol	Pennsylvania
*P. H. Glatfelter Company	Spring Grove	Pennsylvania
*Crown Zellerbach Corp.	Washington Pulp & Paper Corp. Div.	Port Angeles, Wash.
*P—169		
*Container Corp. of America	Coated Board Div.	Chicago, Ill.
GROUP C		
The Eddy Paper Corp.	White Pigeon	Michigan
Strathmore Paper Co.	Woronoco	Massachusetts
Price Brothers & Co., Ltd.	Jonquiere, P. Q.	Canada
The Mead Corporation	Harriman	Tennessee
American Writing Paper Corp.	Parsons Div.	Holyoke, Mass.
Marathon Paper Mills Co.	Ashland	Wisconsin
American Writing Paper Corp.	Crocker Div.	Holyoke, Mass.
The Flintkote Company	Little Ferry	New Jersey
GROUP D		
Central Fibre Products Co.	Tama	Iowa
Union Bag and Paper Corp.	Allen Paper Mill	Hudson Falls, N. Y.
The Mead Corporation	Nashville	Tennessee
American Asphalt Roof Corp.	Kansas City	Missouri
Spaulding Fibre Co., Inc.	Milton	New Hampshire
United States Gypsum Company	North Kansas City	Missouri
Central Fibre Products Co.	Vincennes	Indiana
American Writing Paper Corp.	Mt. Tom Div.	Holyoke, Mass.
Spaulding Fibre Co., Inc.	Hayes	New Hampshire

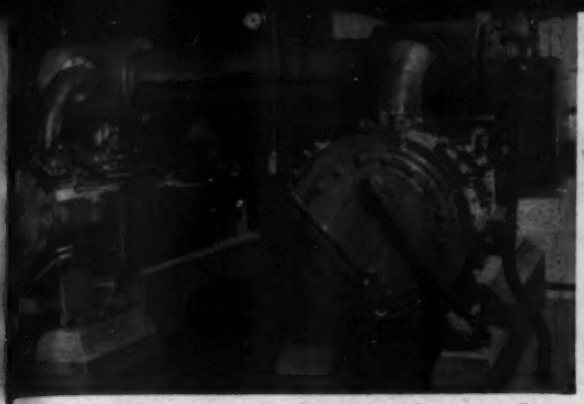
Division II—Paper & Board Re-Manufacturing

The Container Co.	Van Wert	Ohio
Gaylord Container Corp.	Bogalusa	Louisiana
Kimberly-Clark Corp.	Atlas Mill	Appleton, Wis.
Thilmany Pulp and Paper Co.	Bag Mill	Kaukauna, Wis.
*Container Corp. of America	Cleveland	Ohio
Bird and Son, Inc.	Roofing Plant	Shreveport, La.
Bay West Paper Co.	Green Bay	Wisconsin
*Container Corp. of America	Fort Worth	Texas

*August report missing—covers one month only.

SUMMARY OF CONTEST EXPERIENCE

Division	Man-Hours Worked	Reportable Injuries	Frequency Rate 1941-42 (2 Mos.)	Change From July-Aug., 1940
All Divisions	32,172,480	532	16.54	+11%
Paper & Pulp	28,985,945	481	16.59	+ 8%
Group A	16,911,320	214	12.65	− 3%
Group B	7,971,263	150	19.95	+18%
Group C	3,174,602	76	23.94	+11%
Group D	928,760	32	34.45	+30%
Paper & Board Re-Manufacturing	3,186,535	51	16.00	+48%



Nuosetal duplex air compressor, motor-driven, in a southern paper mill

Moore turbo-generator unit, condensing extraction type, serving a Canadian paper mill

Basic equipment that you can count on to maintain and step up production....

Paper stock pump, in a prominent midwestern mill

Motor-driven centrifugal pump, handling white water

Centrifugal 6-stage boiler feed pump, turbine-driven

Centrifugal pump, transferring black liquor and salt cake to a recovery unit

280,000-lb. storage type deaerating feedwater heater, in paper mill service

Motor-driven turbine well pump, for main mill water supply

Worthite chemical pumps on multiple-effect evaporator transfer in a southern kraft mill

WITH present conditions calling for increased output and heavier demands on equipment, the proven ability of Worthington units to deliver superior performance becomes more and more important.

These units . . . for pumping, air compressing, power generation, and power transmission . . . are built with a knowledge of pulp and paper mill requirements, and with margins of capacity that assure the uninterrupted operation which is so vital at this time. Worthington engineers are ready to cooperate in finding the solutions to the problems that now confront you.

WORTHINGTON PUMP AND MACHINERY CORPORATION

General Offices: **HARRISON, NEW JERSEY**

Branch Offices and Representatives in all Principal Cities

IC1-27

WORTHINGTON

NAMES *in the* NEWS

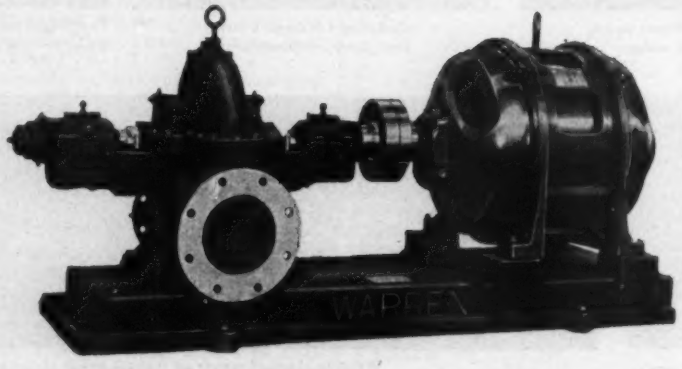
Personals

▶▶▶ *Miss Edith Stroschneider,* Librarian at the Institute of Paper Chemistry, Appleton, Wisconsin, for the past ten years, reads eight languages. They are German, English, French, Swedish, Norwegian, Danish, Italian, and Spanish.

▶▶▶ *Eli DeVries,* who came to this country after the Nazi army took control of Holland, has been made president of Parsons & Whittemore, succeeding Howard Whittemore who becomes chairman of the board. Mr. DeVries had planned to establish an independent paper concern, but instead became vice president of Parsons & Whittemore a year ago. He will soon become an American citizen.

PUMPS

that keep up with the mill



That Warren Pumps have the ability to meet the increased demands of their jobs is being proven every day. Here is a typical case:

At the time of their installation at a well known Eastern Paper Mill, in 1934, 7 Warren Pumps were called on to handle 800 gallons of white water a minute. Then the capacity of the mill increased—so the operating speed of the Warren Pumps increased, also, to obtain the capacity of *900* gallons per minute. Now that the tonnage of the mill has again been increased, the same 7 pumps are obtaining *1000* gallons a minute by operating at a still higher speed themselves.

If this is the kind of performance *you* want, specify Warren on your next pump replacements or additions.

"A Warren Recommendation is never a Compromise."

WARREN PUMPS

Warren Steam Pump Company, Inc., Warren, Massachusetts

▶▶▶ The fine private yacht of *Logan G. Thompson* of the Champion Coated Paper and Fibre Company, Canton, North Carolina, has been taken over by the United States Navy, and has gone into commission at New York. The yacht was given the government by Mr. Thompson.

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▶▶▶ *Dr. C. E. Hartford* has been appointed chief chemist in charge of laboratory control, development and research at the Savannah (Ga.) mill of Union Bag & Paper Corporation, New York City. Formerly, Dr. Hartford was associated with the Southern Kraft Corporation in Panama City, Florida.

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▶▶▶ *G. K. Viall,* vice president of the Chain Belt Company, Milwaukee, Wisconsin, has been appointed head of a new division of research and development recently organized by the company. Mr. Viall has been associated with the company since 1921, and will continue to serve as vice president in charge of the construction machinery division.

◆

▶▶▶ The resignation of *Morton H. Lynn,* consultant in the Paper and Paper Products Section of the Office of Production Management was announced recently by Administrator Leon Henderson. Mr. Lynn left his duties, which pertained to the stabilization of waste paper prices and the organization of the national paper conservation program, to resume his duties as executive director of the Chicago Waste Material Merchants Association.

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▶▶▶ *A. T. Gardner,* formerly of the Combined Locks Paper Company, Combined Locks, Wisconsin, is now superintendent of the Provincial Paper, Ltd., Port Arthur, Ontario.

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▶▶▶ *Gerald Beebe,* former territorial salesman in Indianapolis for Manning, Maxwell & Moore, Incorporated, Bridgeport, Connecticut, has been extended a leave of absence due to illness. *Harry G. Johnson* will succeed Mr. Beebe in this position.

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▶▶▶ OVER 30,000 PERSONS have signed the visitor's record at the Institute of Paper Chemistry, Appleton, Wisconsin. They represent practically every country in the world.

Photograph by Courtesy of Mead Corporation

Experienced paper manufacturers do not measure the value of their wet felts by the number of yards of woolen material in their construction but by the amount of water they remove and the amount of paper that is formed on them. Because Hamilton Felts remove more water they deliver dryer sheets to the driers, enabling the operators to run the machines at higher speeds with fewer stops and less broke. This means more and better paper. Measured in this way, Hamilton Felts are the least expensive wet felts known to the industry.

From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

Miami Woolen Mills

Hamilton Felts

Established 1858

▶▶▶ *Wallace W. Lockwood,* formerly assistant advertising manager of the Taylor Instrument Companies, Rochester, New York, has been advanced to advertising manager to succeed Elmer E. Way, who has resigned. Mr. Lockwood is a graduate of Syracuse University and was employed in two advertising agencies in Syracuse before he became affiliated with the Taylor Companies in 1932. In 1939, he was made assistant advertising manager.

◆

▶▶▶ *J. D. Zellerbach, Jr.,* the son of the late J. D. Zellerbach, president of the Crown Zellerbach Corporation, San Francisco, has joined the personnel staff of the Crown Willamette Paper Company, division of the Crown Zellerbach Corporation, Camas, Washington, under V. C. Gault, personnel director.

▶▶▶ The founder of the Milwaukee Lace Paper Company, Milwaukee, Wisconsin, *Charles Hamilton,* celebrated his 81st birthday at his offices, during the last week of September. Mr. Hamilton founded the company in 1899 and is still its active head.

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▶▶▶ *W. F. Kurfess,* vice president of Joseph T. Ryerson & Son, Inc., Chicago, has been ordered to active duty in the United States Navy. He will leave Washington shortly to take charge of the Steel Division of the Bureau of Ships, Navy Department. Mr. Kurfess has continued his association with the Navy in the Reserve Force as Lieutenant-Commander. Formerly, Mr. Kurfess attended the U. S. Naval Academy, Annapolis, and since his graduation from Purdue University in 1912 has been associated with Ryerson Company.

▶▶▶ Forty-three years of continuous service with the Farrel-Birmingham Company, Inc., Buffalo, New York, were terminated recently, when *Lawrence K. Blackman,* assistant treasurer, retired from active service. Mr. Blackman entered the employ of the company as a bookkeeper at its Ansonia (Conn.) office in 1898, and was elected to the position as assistant treasurer in 1930, which position he held until his recent retirement.

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▶▶▶ The offer by *Hugh J. Chisholm,* president of Oxford Paper Company, Rumford, Maine, of his Westchester County estate, at less than half its assessed value, for use as a government airport, may be rejected. Two other sites have been considered as being more suitable locations, though Mr. Chisholm's offer was the best proposal from the financial viewpoint.

Necrology

CHARLES H. ROBERTS

Charles H. Roberts, treasurer of Johns-Manville Corporation, New York City, passed away recently at the age of 51. Mr. Roberts received his secondary education in Trenton, New Jersey, and attended the Wharton School of Finance of the University of Pennsylvania, graduating in 1907.

He immediately started his business career with J. A. Roeblings Sons Company, as head of their cost department and later served in various capacities of the Mercer Automobile Company, Hess-Bright Manufacturing Company, U. S. Rubber Company, Splitdorf Electrical Company, and Julius Kayser & Company. In 1928, he joined the staff of Johns-Manville as assistant general auditor and during the same year was made general auditor. In 1937 he was made comptroller and the following year was appointed treasurer.

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▶▶▶ *Samuel B. Hinsey,* former superintendent of the Niagara Paper Mill, Lockport, New York, passed away recently at the age of 76. Mr. Hinsey had been associated with this company for 22 years and was considered an expert in the dyeing and color-blending of paper.

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▶▶▶ *Landon Carter,* secretary-treasurer of the Eastwood-Nealley Corporation, Belleville, New Jersey, passed away September 3 at his country home in Califon, New Jersey. Mr. Carter had been associated with this company for the past 20 years, during which time he made many contacts with the paper mills throughout the country. He is survived by his widow.

WILLIAM J. PEACOCK

Although he retired from active work in the industry more than 15 years ago, a large number of friends and admirers in the industry will be grieved to learn of the passing of "Bill" Peacock, as many of them knew him. Mr. Peacock passed away September 19 at Green Bay, Wisconsin, where, until 1935, he had been personnel manager of Northern Paper Mills.

During his active years in personnel work, Mr. Peacock became particularly well known for his leadership in the Paper and Pulp Section of the National Safety Council. He served as general chairman of that group for three years, 1926-1928, inclusive, and although he has been missed at the regular meetings since his retirement, the work he did in the furtherance of safety was often spoken of when groups discussed safety problems.

William J. Peacock

Mr. Peacock was born in Pittsburgh in 1876. He attended Denissen University, Bucknell University, and the University of Chicago, after which he entered the Baptist ministry. He became associated with Northern Paper Mills in 1920.

Surviving are the widow and two sons, Morris, of Evanston, Illinois, and Curtiss, of Green Bay; also a sister in Coventry, England.

◆

MR. & MRS. BENTON

As Mr. and Mrs. Ben Benton and family were returning from a vacation trip, they were fatally injured in an automobile accident on September 27 near Allentown, Pennsylvania. Mr. Benton was chief engineer of the Chillicothe Paper Company, Chillicothe, Ohio.

Their two children, a son and a daughter, suffered minor injuries, and a relative traveling with them also was injured.

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▶▶▶ *Marselis Clark Parsons,* retired importer and exporter of paper and paper pulp, passed away September 26 at the age of 75. Mr. Parsons retired in 1926 as head of the Parsons Trading Company, New York City, which business he took over after the passing of his late father, William H. Parsons. He is survived by his widow and son.

PIONEERING *with* SAFETY

Almost every new Industrial Development demands something new in the way of valves. Valves to handle new pressures, new temperatures, new chemicals. Valves which must be engineered to fit the job, and which must perform from the moment they are installed.

The degree of success which is to be attained by a manufacturer in meeting such requirements is measured by the experience, skill and equipment of its engineering staff. In these essentials Powell acknowledges no superior.

The valve shown here is one of a complete line of Gate, Globe, Check and Relief valves and liquid level gauges especially designed for the process industries. They are made from a wide variety of pure metals and alloys including Monel, stainless steel, aluminum, acid bronze, etc. All patterns are specially designed to insure homogeneous castings from the particular metal used.

The Wm. Powell Company
Cincinnati, Ohio

Convention Papers . . . Abridged

The Work of the American Paper and Pulp Association

J. L. RIEGEL, President
American Paper and Pulp Association

The American Paper and Pulp Association is the oldest national association in the country, having held consecutive meetings since 1878. As a matter of fact, rag paper manufacturers were co-operating on legislative matters in 1819. The normal functions of the Association have covered a wide scope; possibly the widest of any trade association in the country as indicated by the award for its program for 1940 made by the organization of American Trade Association Executives.

The A.P.P.A. is a federation of some 16 divisions. Paper and pulp mills are members of these divisions, and not of the parent association. This set-up has proved most advantageous, with the divisions concentrating on their internal problems, and the parent association on overall industry problems, and particularly on relations between Government and Industry.

There is, of course, the National Paper Board Association, which represents the manufacturers of paper board. This group is entirely distinct from the A.P.P.A., although co-operation in over-all industry operations is frequent. The Newsprint Manufacturers Association of the United States is a distinct organization, not a divisional member of the A.P.P.A., but it is affiliated.

The staff of the A.P.P.A. consists of the Executive Secretary, Mr. Tinker, 4 assistants, and 12 other employees, 17 in all.

The work of the Association can ordinarily be divided into several major classifications: legislative matters, industrial relations, statistics, costs and accounting, traffic problems, forestry, economic research, special problems; and at the present time, national defense.

Over the course of a year's time, every major national industry faces introduced legislation which, while aimed at benefiting one geographical section or group of people, would penalize the industry and the nation as a whole if the legislation were enacted. In the recent past, the paper and pulp industry has been faced with any number of vicious congressional bills such as H. R. 99 and H. R. 15. The former bill would have required the paper industry to consume a substantial portion of the cotton surplus or pay the penalty of a heavy tax, regardless of whether or not new cotton was technically suitable for paper manufacture and completely ignoring the factor of costs. H. R. 15 proposed a gigantic economic investigation of the paper and pulp industry; an investigation for which no real reasons could be determined. In the normal course of its work, the Association presented the industry's case and side of the picture to members of Congress and the bills were defeated before they ever reached the floor of Congress. Such work is, of course, an impossible task for the individual company.

There are now pending in Congressional Committee two bills designed to place under strict government regulation, with power concentrated in the hands of one individual, all privately owned forest lands in the country. I need not point out to you that the control of the raw material resource means control of the industry. This legislation is being carefully studied and the industry's case in opposition is being prepared for presentation. These are only three samples of the type of legislation with which the industry is faced, but they suffice to show the Association's function in this field.

In the field of industrial relations, the work of the Association covers a wide variety of activities. Among these are the analysis of union agreements surveys of wage rates, monthly and quarterly reports showing trends of wages and hours, and general educational activities such as development of apprenticeship programs in the industry.

The statistical work of the Association has been developed over a long period of years. Records of capacity, production, raw material costs, wage rates, and all other industry data needed to an intelligent understanding of the immediate and long-run status of the industry are compiled for the necessary time periods and transmitted to management promptly. An integral part of this program is the annual survey of financial conditions in the industry. The value of this material to management as a basis of comparison and for development of company policy is obvious, but from an overall industry viewpoint this material has proven invaluable in the hands of the Association in its dealings with Government.

In the fields of costs and accounting the Association maintains as an integral part of its organization a department known as the Cost-Engineering Service. An eminently well-qualified consultant with the assistance of a staff member of the Association is constantly engaged in advising companies with regard to the best prevailing cost and accounting practices in the industry and in installation of systems. Because the Association absorbs the overhead, this work can be done at a minimum of cost to the company. Since a company can only act intelligently as it knows its costs, this work is of value to the entire industry.

The traffic work of the Association under the able guidance of its Traffic Committee is too technical and involved for me to discuss. Suffice to say, however, that with the recent accomplishments in paper and paperboard freight descriptions, this industry is now in rather a satisfactory position from a transportation angle. At the present time a program is being considered to have paper and pulp given a high priority rating among civilian goods for transportation purposes.

For nearly forty years, certain public agencies have been dwelling upon the impending timber famine, the industrial rape of the forests, and the necessity for federal regulations of privately owned forest lands. Actual practice and association research have definitely disproven any prospect of a timber famine and actually the forest lands of the paper and pulp industry are in an eminently satisfactory condition. Realizing the importance, however, of a continued and assured supply of wood, the Association has as consistently urged good forest practices upon the industry as it has fought government regulation of its forest lands.

Early in the National Defense Program it became apparent that the regular operations of the paper and pulp industry would be severely affected by an unprecedented demand for paper and pulp, by shortages of materials needed by the industry and also critical to the Defense Program, and by other factors. An industry defense committee was appointed with Mr. Ralph Hayward as Chairman, to study the many problems and to co-operate with the Government in every way possible. Because of many rumors and statements which were rampant early this year to the effect that a pulp and paper shortage was immediately imminent, the first major job undertaken by the committee was a study of paper and pulp productive capacity as compared with demand as estimated by the Office of Production Management. The report was compiled at the expense of a considerable amount of time of the committee and was accepted by the OPM. Time has proven the findings of the report to be absolutely sound, and a second report covering the situation for 1942 will be undertaken in the near future and transmitted to OPM.

The Committee's dealing with OPACS have likewise been satisfactory and permitted orderly adjustments to be made in the industry. The industry entered 1940 with a depressed price structure and a record conspicuous by its low profits or absence of profits. Reports covering cost-

Some of the papers presented at the fall meeting of the Technical Association of the Pulp and Paper Industry held at Ann Arbor, Michigan, September 15-19, 1941, have been abridged, and condensations of these papers will appear from month to month until completed. This is the first installment.

Wood's

ECONOMY AT WORK

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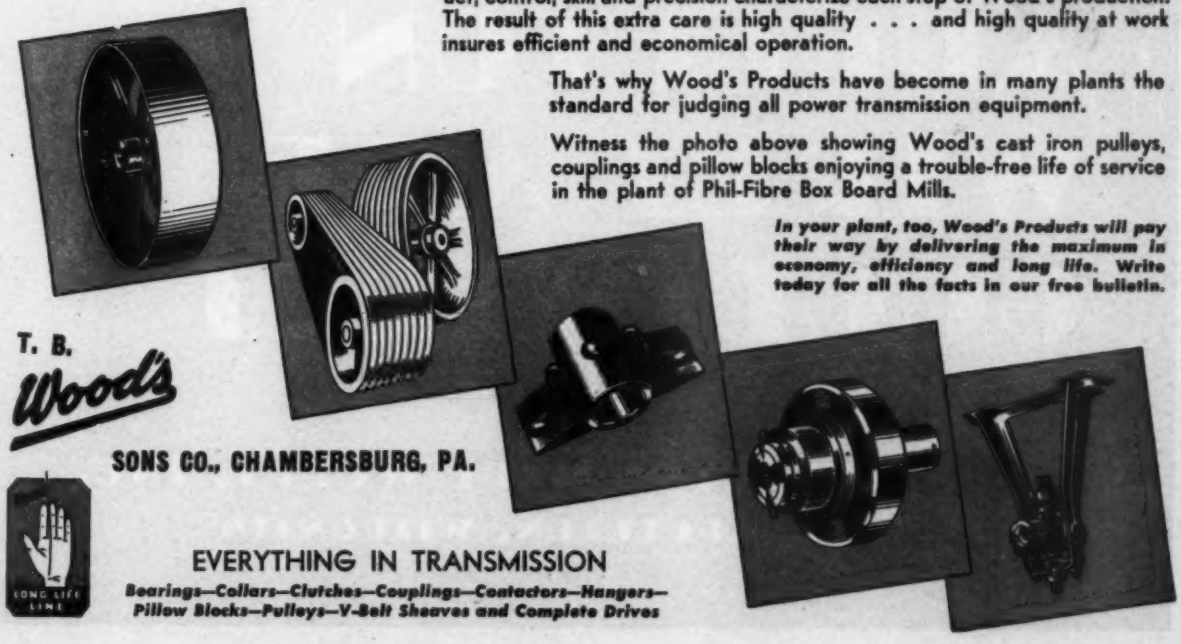

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price relationships in some major grades of paper were submitted to OPACS which permitted price adjustments to cover rising cost schedules. There has been no threat of price ceiling establishment in the paper and pulp industry.

In the matter of priorities on critical materials, the Association has maintained an office and small staff in Washington for some months past to facilitate the applications for priority ratings on materials needed by paper and pulp companies. This office, judging by the results, has been a huge success; over one hundred companies having received satisfactory service.

At the present time the Association and its Technical Committee are engaged in work with which many of you are familiar. I am referring to the solution to problems created by the requisitioning of chlorine for defense used. The industry is now facing a minimum curtailment of at least forty per cent of its normal consumption of chlorine. For several weeks past the Technical Committee has been analyzing and correlating data of chlorine increment and pulp brightness in order that OPM may direct chlorine curtailment for defense use in an intelligent manner. This entire project is being conducted in collaboration with OPM. Apparently, a much greater chlorine curtailment is in prospect for 1942 and the last chapter in the industry's position has not yet been written.

The American Paper and Pulp Association and Current Problems of the Pulp and Paper Industry

E. W. TINKER, Executive Secretary, American Paper and Pulp Association

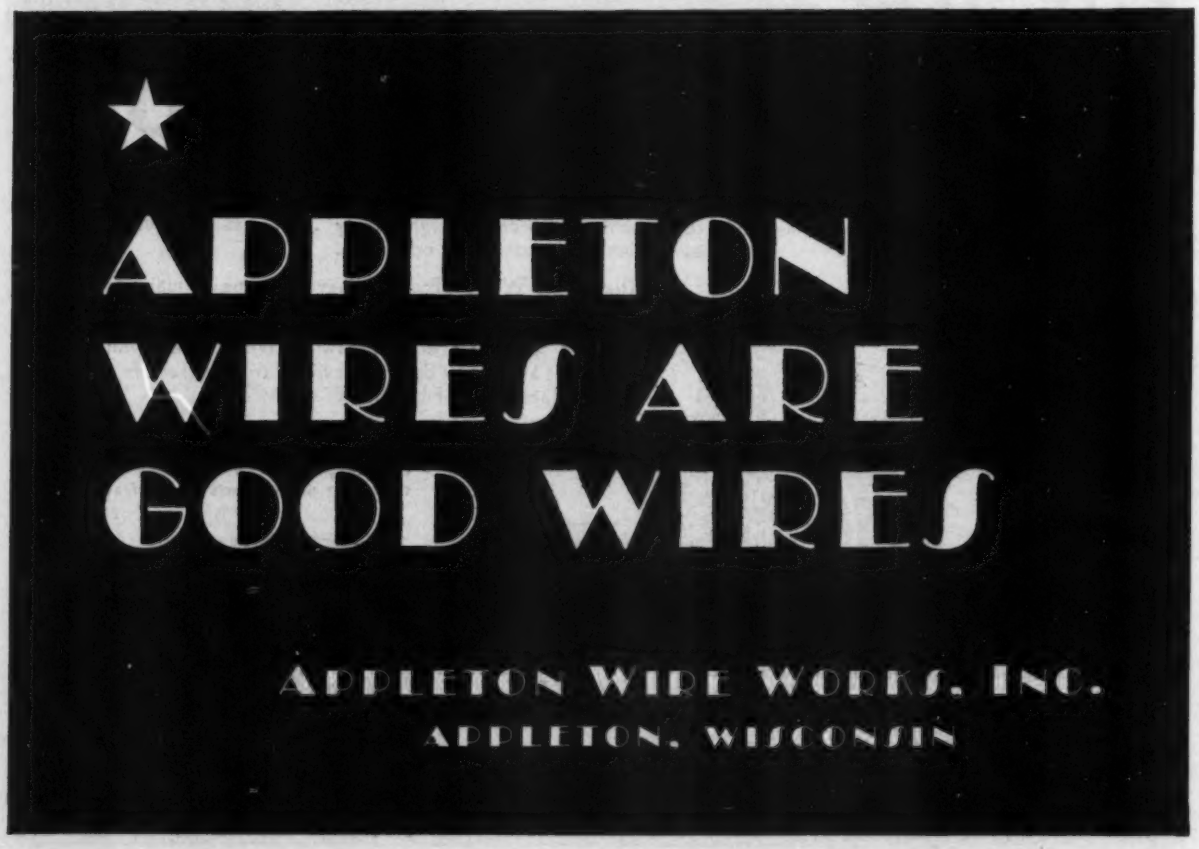
Consideration of the current situation and prevalent problems of the paper and pulp industry necessarily involves extraordinary conditions created by the National Defense Program. In reviewing these problems it would be well to look at the industry's record since the initiation of the defense program. The pulp and paper industry was one of the first, if not the first industry, to feel the direct impact of the European wars. With the beginning of naval warfare and later the invasion of Scandinavia, the normal shipping of pulp supplies, upon which domestic mills are so dependent, were disrupted and shipments rapidly dwindled to the vanishing point. The law of supply and demand reacted immediately and so dramatically on the domestic industry that the situation was early recognized by the National Defense Advisory Commission.

The economic distortions that were inevitable in connection with the tremendous defense program and the vast expansion of war industries involved have necessitated rapid adjustments within the paper and pulp industry as in other industries. As conditions, because of changed cost-price relationships, made it necessary to make adjustments in order for the industry to continue to operate, maintain employment and meet civilian and military requirements, changes have been made but always with full understanding and consideration of the industry's responsibility in the general pattern of our national economy.

The existing and potential situation in relation to the fibrous material supply is of acute interest. The impact of the withdrawal of a considerable percentage of the normal supply of chlorine available to the industry has presented an extremely difficult and complicated problem with which the industry is now struggling. Lack of a solution will bring about chaotic conditions in the marketing of paper which will not only injure the industry but will result in consumer loss as well. The paper and pulp industry, operating at capacity, is tremendously concerned with the obtaining of necessary repair and replacement parts under the prevailing priority system. Parallel with the problem of metal supplies is the question of processing materials and furnish. The transportation problem both with respect to adequate shipping and available cars of all descriptions may prove a bottle-neck that will seriously affect the industry's accomplishments.

The American Paper and Pulp Association is endeavoring to co-operate not only with Government agencies interested in maintenance of civilian and military paper requirements, but is endeavoring to anticipate the exigencies that may arise and develop plans for the avoidance of emergencies in as far as possible.

In the case of metals, in co-operation with the machinery manufacturers, an inventory of the required supplies to main-



tain normal operations through availability of repair and replacement parts and equipment has been made. From this inventory, it is expected to place in the hands of OPM officials the normal industry requirements, with the hope that provision will be made for the pulp and paper industry's continuous normal operation. Under like necessity, an inventory is being made of the processing materials essential to the continued operation of the industry. In this case the information is being obtained from the mills themselves and here again, if the Government agencies concerned feel that continued maximum production from the industry is desirable in the public welfare, some blanket priority rating for the materials must be given or operations will be materially curtailed.

The directorate of the American Paper and Pulp Association is seriously concerned with the performance of the industry operating under the stress and strains of the times. It is the belief that given reasonable consideration and co-operation the industry can do a pretty good job in meeting both civilian and military requirements.

The paper and pulp industry is now and will in the future operate at maximum capacity if it is given the materials to work with. It can do no more and I repeat that as a current problem the Association is most concerned with the maintenance of its high operating ratio and the obtaining of materials and supplies necessary to do so. It is also concerned with the avoidance of programs that will do irreparable injury to the industry and restrict future civilian use. It believes it can meet the present situation with only isolated instances of critical shortages and that, accepting the premises that defense requirements must take precedence, a little tightening of the civilian belt can be achieved without undue turmoil and disturbance of the public mind—all this in spite of the almost astronomical predictions of future military usage.

Price Control Policies

HERBERT F. TAGGART,
Assistant Administrator
Office of Price Administration

In common with the businessmen, I am a thorough believer in the desirability of letting price perform its normal function —to equate demand and supply. In the long run, administered prices, whether administered by the combined action of businessmen or by a department of the Government, are certain to be less satisfactory from a social point of view than free prices. They will result in lower production, less satisfactory distribution and a lower standard of living than will prices freely determined in the market place.

What many opponents of price regulation forget is that we are essentially in a war economy and that the very existence of the national institutions which we prize so highly depends on all-out effort to furnish first the goods and services required for defense and secondly to maintain as far as possible those goods and services and conditions which are necessary for civilian comfort, health and morale. To this end, all must be subordinated.

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In view of the legislation pending in Congress, the activities and policies of the Office of Price Administration are very properly being subjected to intense scrutiny. If protection of the American economy from the desperate consequences of inflation is to be entrusted to any organization, it is only reasonable that the actions of that organization should be reviewed for the purpose of determining what its policies have been and of forecasting what may be expected in the future.

To my way of thinking, a very significant characteristic of price administration to date is the reliance which has been placed on voluntary action by industry in preference to rulings imposed by authority. A number of reasons for this attitude might be adduced, but to me, one of its most important aspects is its reflection of a fundamental unity between industry and the administration as to the vital necessity of putting a stop to inflation before it gets a start.

It might be supposed that voluntary agreements were resorted to because of the lack of specific legislative authority to control prices—in other words, that they are a sign of weakness. As a matter of fact, quite the contrary is probably true. I look for a greater rather than a smaller use of the voluntary method after price control legislation is passed. The paper industry affords, in its several branches, excellent examples of the advantages of voluntary agreements and, I am sorry to say, at least one example of a total failure of this procedure.

A study of the prices with which we have thus far been chiefly concerned reveals a determination to put first things first. Three kinds of prices have engaged our principal attention: those which have the broadest effect upon the economy as a whole, such as steel and other basic raw materials; those which are most volatile and subject to speculative influences, such as secondary metals and items traded in on the commodity exchanges; and, finally, those which constitute the costs for later stages in production. This last pre-occupation is one of our most important sources of strength, whenever it is possible to show converters and fabricators that we have been of assistance in keeping costs down.

It would be a mistake to assume that the Office of Price Administration is interested only in low prices. We intend to keep prices down, but not at the expense of production. In certain cases we have watched prices rise with the greatest equanimity, since it was evident that only by increases in price could we obtain that expansion of production which is the basic requirement of the defense effort and, in the long run, of price stability.

A cardinal principle of OPA is that price increases solely caused by increased demand will not be tolerated. Where price increases are not justified either by increases in costs or by the reasonable hope of increased supply, but are solely occasioned by the fact that supply is short as compared to demand, no sympathy need be expected.

Two other attitudes of OPA with regard to causes or excuses for price increases are worthy of comment. One is that, although we recognize the importance of actually sustained increases in costs, we look very unsympathetically at the notion that prices must be increased now to take care of vaguely defined cost increases which are expected at some indefinite time in the future.

Another argument with which we are frequently confronted is that the particular concern or particular industry has suffered heavy losses over past years and must now be allowed to make these up. A variation of this is the argument that the industry in question is one in which seven lean years follow every fat year. This—the year 1941—is the proverbial fat year, and we must let industry put on a little fat to take care of the lean years ahead. There are several answers. One is that, after all, this fat year is a result of the defense program. It is not a natural, but an artificial business boom. The principle has been enunciated that we are to have no wartime millionaires. The putting on of fat, therefore, must be in strict moderation.

My particular responsibility in the OPA is the cost aspects of price control.

The cost accounting or, more precisely, cost analysis work in connection with price control may be roughly divided into three categories. The first consists of cost studies made in contemplation of either formal price schedules or voluntary ceiling agreements. No such arrangement is ever entered into without giving consideration to the cost factors involved although

nothing like an exhaustive cost study is undertaken at this stage.

The second variety of cost study takes place after the schedule or agreement has been established. Its purpose is to discover how the prices are working and to prepare the ground for revisions or modifications. Such surveys may be industry-wide in scope, but they are ordinarily carried on by means of sampling.

The third kind of cost study deals with the problems of individual enterprises. In its most complete form it involves a thorough examination of costs, sales, markets, operating problems and policies, and financial history and position. The purpose is to discover whether the particular concern requires relief or other special treatment in connection with established price schedules or announced price policies.

These individual studies have, up to the present, taken a very large portion of the time of the accounting staff of OPA. They unquestionably constitute the most interesting part of our work, since they comprehend the whole range of business analysis, and not merely a study of accounting data.

Such studies originate most frequently after an official price schedule has been promulgated. Price schedules necessarily apply to everyone in an industry on a uniform basis. However, it is recognized that such universal rules, if inflexibly applied, may result in serious hardships to individual concerns. Hence, an invitation is always extended to present such hardship cases for special consideration. Figures and other data are examined; legal, marketing and engineering considerations are given due weight; a report is written, accompanied by a recommendation to the Administrator that the particular type and extent of relief desired should or should not be granted. Such relief has already been extended in a considerable number of cases.

One of the most fascinating parts of our job lies in the fact that we must look into the future—we must try to see how a certain set of circumstances and a certain course of action may be expected to affect both the financial statue of our "clients" and the supplies of the commodities which we want them to produce. A highly developed imagination is an essential qualification for employment in our accounting division.

I always like to spend a few minutes of each talk I give speculating on what are our chances of doing a respectable job of controlling the inflationary spiral. No one supposes that we can do a perfect job. The problems are to complex and the forces at work too powerful.

Our greatest source of strength lies in the fact that the long-run self-interest of element of society has a huge stake in our success. The farmer will not profit by higher prices for his products if the prices of everything he buys go up correspondingly. The worker's economic status is not improved unless his real wages are maintained. The businessman remembers with a shudder the inventory writedowns of 1920 and 1921. Our greatest weakness lies in the fact that many of these people have the idea that somehow they will be

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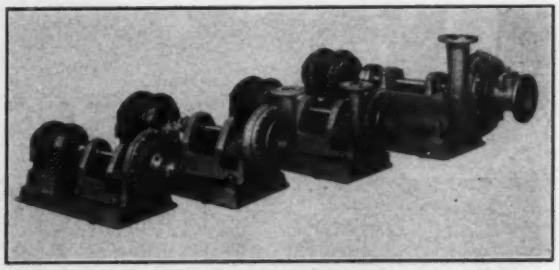

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able to get their prices up while others stay down—the idea that somehow they will be able to steal a march on the other fellow. Price control receives their wholehearted support—when applied to their neighbor's prices!

In spite of obvious difficulties and complexities, in spite of many disappointments already experienced, I continue to be moderately optimistic. We have studied the experience of other nations and of the last war assiduously. We think we know where some of the mistakes were made and how to avoid them. We have gotten a much earlier start than did our predecessors in 1917, and we already have a veteran organization. Accounting and statistical data are much more complete, reliable, and available than they have ever been before. Other powerful government agencies are solidly back of the fight against inflation and are in a position to supplement our efforts by actions tending to cut down demand or to increase supply. With all these things in our favor we at least have a fighting chance.

Abridgments have been prepared of a number of the papers presented at the annual convention of the American Pulp and Paper Mill Superintendents Association, which met at Poland Spring, Maine, June 17-19, 1941. These abridgments have appeared in the July, August and September issues, and the final installment is published this month.

Knowns and Unknowns in Coating Colors

BEN W. ROWLAND
The Institute of Paper Chemistry

With the introduction of the so-called machine coating operation, the field of coating technology has required extension to include not only the consequences of mechanical innovations in the operation, but also the influences of higher speeds. Basically, all coating operations are alike in that color is applied to raw stock and, for this reason, there appear to be certain critical fundamentals relating to all coating procedures. In the standard and slower speed coating practice, many of these variables are known and can be kept under control through the usual expedients in color compounding and machine operation. Some of the variables which appear to be critical only to a minor degree in the slower coating practice, however, become extremely critical in the fast operation, due not only to increased speed but also to the different mechanical conditions as well. Consequently, more exacting conditions are imposed by the operation which not only require unusual care in color formulation but also a precise control of many other factors.

In this discussion, we refer to the rapid paper-machine coating operation, the essential feature of which is the application of the color by means of roll pressure. It has been experienced by all familiar with this operation that a satisfactory coating is produced only when a rather complex set of conditions are favorable. Many of these conditions relate to the color.

In evaluating the suitability of the color, the coated sheet itself, made with the color in question, will be the best guide. It is now well established, at least in all cases that have thus far come to our attention, that a viscosity measurement either on the clay-water mixture or on the completed color, using any standard type viscometer with a fixed rate of shear, has practically no significance as an index of the coating characteristics of the color. Such a measurement may serve a useful purpose as a rough guide in order that the color may be held within a certain range of consistency, but no more.

As pointed out by the author recently, the clay itself has been found to exert a profound influence, perhaps a predominating one, on the colloidal properties of the coating color. Without attempting to review this interesting subject of clay at this time, it is important at least to emphasize again that the correct choice of clay or blends of clay is essential if the color is to adjust itself to the given operation.

The inadequacy of the usual viscosity measurements to characterize the coatability of the color is demonstrated by experience with the actual operation and by studies in progress in our laboratories. This is because of peculiar flow properties which deviate strongly from those of simple viscosity as in a viscous liquid. Among the variables which influence these flow properties are the following:

Clay mineral species
Particle size of clays and base exchange factors
Solids content of color
Amount and type of starch
Pressure of coating rolls
Type and amount of dispersing agent
Machine speed
Absorptive qualities of the raw stock

Before considering the phenomena attending the application of the color to the raw stock, it is necessary to observe certain capillary phenomena that will play a role in the receptivity of the paper for the coating. It must be clearly realized that the resistance of paper to water penetration and the resistance to the penetration of colloidal matter are not one and the same. What underlies this difference is, in large measure, the electrocapillary effects that originate from the electric charges lining the walls of the pores in the sheet and the electric charges carried by the colloidal particles of the clay and starch. The measurements of these charges on cellulose, clay, and starch show that all are normally negatively charged. If this be the case when the color is applied to the sheet, the conditions are favorable for appreciable penetration of the starch, and possibly some of the clay, into the pores of the sheet, because in this instance the negative starch or clay can pass

over the pore surfaces bearing the same charge. If, however, as can be demonstrated and as has been demonstrated in our laboratories, the pores of the sheet can become positively charged through the presence of such materials as alum and alumina, the capillary phenomena are quite different. In this case, the starch will still be negative, but, in making its entry into the pores of the paper, it will be attracted to the positively charged walls and its farther penetration will become arrested. These effects can be readily demonstrated by the use of dyestuffs, using the acid dyes as the negatively charged particles and the basic dyes as positive.

It is now in order to consider the several colloidal phenomena that accompany the application of color to stock. In this instance, let us confine our attention to the mechanical conditions of fast coating machine operation. Essentially, we need only to assume for this purpose that the raw stock is passing through a roll nip and that the coating is being applied simultaneously to both sides of the sheet as it enters the nip. The factors which we have stressed above are: (*a*) viscous flow properties of the color, (*b*) water-holding capacity of the color, and (*c*) the receptivity of the raw stock. Inasmuch as all of these factors operate simultaneously at the instant of contact of color and raw stock, it is impossible to consider them separately. What probably happens is something like this: As the pressure of the roll is exerted on the color, the latter will either become more fluid (thixotropy) or less fluid than it would appear when examined by laboratory instruments measuring viscosity at low rates of shear (dilatancy). If it becomes more fluid, the consequence is obviously that of great thinning out and a greater release of water to the raw stock. This release of water to the raw stock will, for the reasons outlined above, be governed by the characteristics of the stock. The water and adhesive transfer, in any case, will have much to do with the anchorage of the coating to the sheet, its thinning down (basis weight), and the manner in which it will smooth out. There must be an optimum water and adhesive transfer for best results in anchorage to the raw stock, leveling-out properties, freedom from dusting, and flaking off of the color.

After the coating leaves the pressure of the rolls, there will be an instant during which the color will not have recovered from the pressure exerted upon it; its solid content, due to loss of water, will be considerably higher, especially in that zone of concentration where, according to recent work in our laboratory, the dilatant tendencies are most in evidence (65-70 per cent). The presence of dilatancy for an instant after the product leaves the rolls will result in a slight amount of rigidity in the coating and a loss of flow properties. This will retard or prevent leveling out under the influence of gravity, but at the same time it will prevent the sucking down of the color into the raw stock as the latter expands due to the absorption of water and the attendant swelling action. A generally opposite set of consequences can readily be visualized for the case in which the color may possess thixotropic tendencies under the shearing conditions which prevail. However, there are compensating forces at work because of

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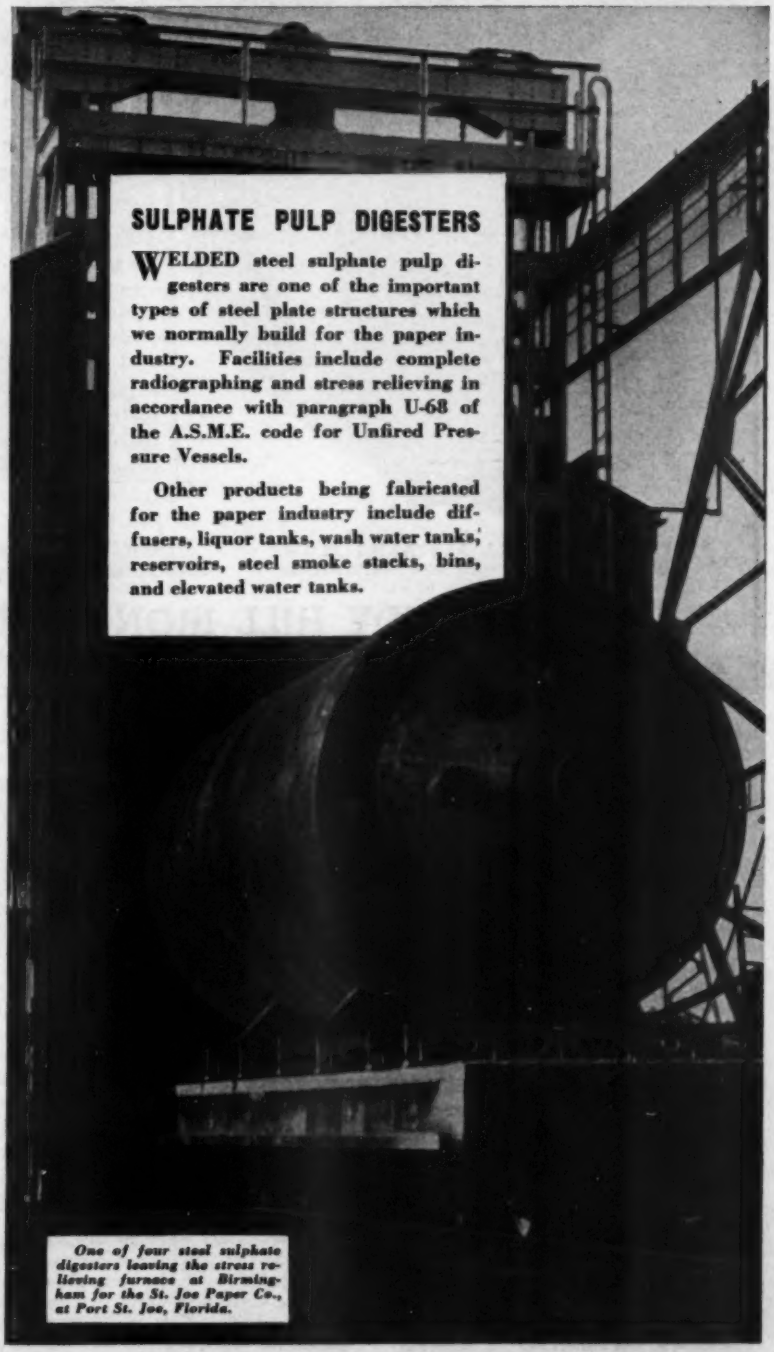

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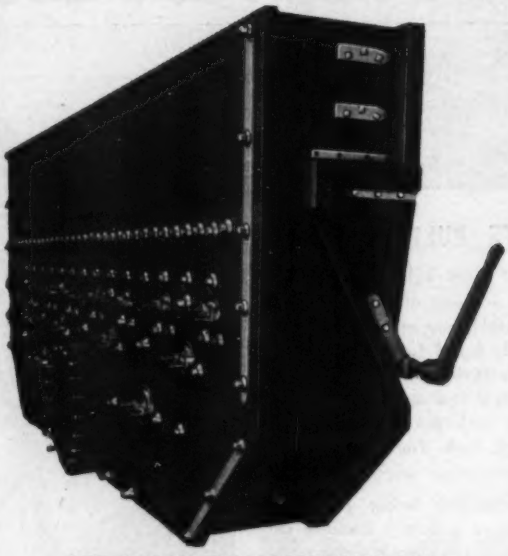

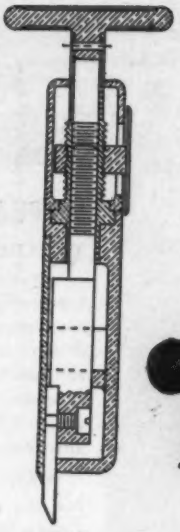

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the two essential matters of flow and water release. It happens that thixotropy is more generally an attribute of the more hydrous clays, whereas dilatancy is more common in the less hydrous clays. Thus the effect of rapid shear on a hydrous thixotropic color will cause it to thin down, but the release of water by the color under these conditions is somewhat resisted by the strong water-holding capacity of the hydrous clay. Also, the influence of pressure on a dilatant color will cause the less hydrous clay to thicken and the water release, even from a less hydrous clay, will be greatly diminished by the onset of the dilatant condition.

In conclusion it may be stated that this discussion has not given emphasis to the other variables as listed earlier. Among these the choice and amount of dispersing agent for the clay, the choice and amount of converted starch, the solids content, the characteristics of the raw stock, roll pressure, and machine speed, are all inter-related in a manner that would involve too much detail for the present discussion, even if the complexity of their inter-relation were sufficiently known. Research and experience will, it is believed, not only lead to new knowledge concerning the known variables in problem, but will doubtless reveal additional factors which thus far have escaped recognition.

Some Further Experiences with Forced Circulation

D. C. PORTER, Superintendent of Sulphite Kimberly-Clark Corporation

After more than nine years of operating sulphite digesters equipped with forced circulation systems, we are able to draw some sound conclusions as to what we think the design of the systems should be and what the economic gains have been.

The original installation of Kimberly-Clark's circulating system, at the Kimberly Mill, consisted of a collector ring or strainer located just below the top girth strap of the digester, piping to convey the liquor to the circulating pump, a single suction 1000 g.p.m. pump, a two-pass tubular heater for indirect heating, and piping to return the heated liquor to the bottom of the digester. Although this equipment enabled us to obtain a thorough and uniform circulation in the section of the digester between the bottom and the collector ring, like most installations that may be considered of a pioneering nature, it did not go quite far enough toward the point of perfection which we were seeking. From the ring to the top of the digester, only natural circulation was taking place and consequently the chips in this area were being cooked at a lower temperature than those in the well circulated part of the vessel.

To correct this condition, the design of the system has been changed and piping, to return a proportional part of the heated liquor to the top of the digester, has been added. The result has been a marked decrease in rejections or uncooked chips and a pulp that is more nearly uniform throughout the entire digester. Another benefit of the changed design is that it allows a much more rapid rise to maximum temperature without an increase in rejections, as was the case in the original design, which may be used either to obtain a saving in cooking steam by cooking at a lower maximum temperature or a shortening of the cooking cycle to increase plant capacity.

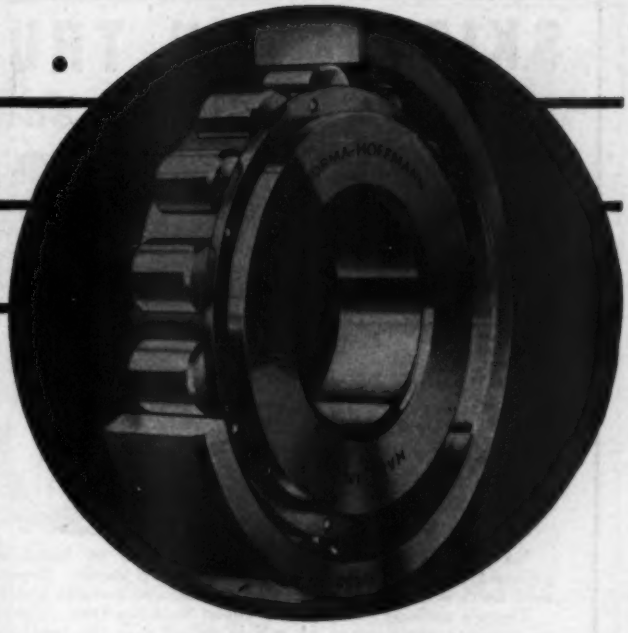
To make the use of fully automatic temperature control possible on the installations using direct steam, a Hydroheater, specially designed for this work, has been incorporated in the circulating system design. The Hydroheater, fitted with a diaphragm motor steam flow control feature, is used in conjunction with a time-cycle temperature controller and its operation is identical to the operation of any air operated steam valve which is used for temperature control.

At the start of our experiments with the circulating systems we were seeking an improvement in quality and uniformity only and expected an increase in capacity due to an increase in yield per unit of wood, but to gain the uniformity and quality improvements anticipated the need for a chip packing device was indicated.

The machine developed, known to the industry as the Babcock-Wilcox-Kimberly-Clark chip packer, consists of a rotating, adjustable metering plate which feeds chips at a controlled rate to a set of rotating and adjustable bats or paddles slightly below the neck of the digester.

It is generally known that with any type of filling, the slower chips run into the digester and the wetter the chips are, the tighter will be the packing. To our knowledge, the Babcock-Wilcox-Kimberly-Clark

For . . . . SEVERE RADIAL and SHOCK LOADS



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PURE PRECIPITATED OXIDES OF IRON

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PERMANENT in color... Unaffected by light, acids or alkalies . . . Possess high tinting strength . . . Have good fiber adhesion . . . Are soft and smooth in texture . . . Show low loss in wash water.

We will gladly send samples and complete technical information.

MAPICO REDS are available in four standard shades. Extended with white, they produce a pleasing variety of orchids, corals and pinks.

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● If you feel a special bed plate or beater bar will solve a beating problem, ask our engineers for their assistance. They know beater tackle—can help you choose a special or standard design from the complete SWW line.

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The famous Skid-Em-On (Model P) and loader with automatic device which lifts and locks the skid.

No other hand trucks combine simplicity of handling with speed necessary for handling as do the Skid-Em-On trucks. Reports from paper mill users throughout the United States and Canada testify to this fact.

There's nothing complicated about Skid-Em-Ons. . . no fancy gadgets or complex mechanism. A roll is rolled onto the truck, nestled gently into a specially-designed cradle and rolled off easily and without effort. Economy, that's the best thing about Skid-Em-Ons. *One man* can handle all operations connected with this truck . . . loading, carting and unloading! Interested? Just drop us a line . . . we'll be glad to supply you with full information.

CENTRAL MACHINE WORKS

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packer is the only one which permits easy and ready control of the chip filling rate and type of packing.

During the course of the studies in connection with the chip packer, the procedure of steaming the chips during filling was carried out. Although nearly all are familiar with this practice, it might be well to cover it briefly here. As the chips are being charged to the digester, direct steam is admitted through the steam nozzles in the bottom tee and cone and continued until the entire chip charge is thoroughly heated. An approximate estimation of the additional chips charged to the digester by this procedure can be made by completely filling the digester with chips and then injecting the direct steam, taking note of the drop in the chip level when the chips have been completely steamed.

This procedure also insures a maximum charge of acid at the start of every indirect heated cook which allows a sufficient quantity of acid to remain in the digester during and after the recovery period to maintain circulation. There are, however, dangers attached to this practice as well as benefits. When the digester is completely filled with acid, the pressure for the first three and one-half to four hours will be hydrostatic in nature and very difficult to control. If the control system should fail and the vessel is not equipped with a safety release, pressures in excess of the safe working pressure of the digester may be set up suddenly. After a portion of the liquor has been evaporated and there is a gas space at the top of the digester, failure of control is not quite so serious, as the pressure rise is quite gradual and would ordinarily be noticed in time to prevent any damage.

When the chip filling phase of our operation had been worked out to the point where a further increase in the quantity of chips charged to the digesters made it difficult to get clean blows, our efforts were directed to the recovery of sulphur dioxide in the later portion of the cooking cycle.

While working on the gas recovery problem, we noticed there was a marked decrease in the circulating rate toward the end of the cook, evidenced by the decrease in power consumption, which coincided with the removal of large quantities of gas from the digester. However, when the relief valve was closed, to build up the pressure for blowing, the circulating rate returned almost to normal. We reasoned that the reduced circulation was due to foaming caused by the rapid evolution of gas and that if a higher average rate of circulation could be maintained during this period, more gas could be recovered for the fortification steps of the process.

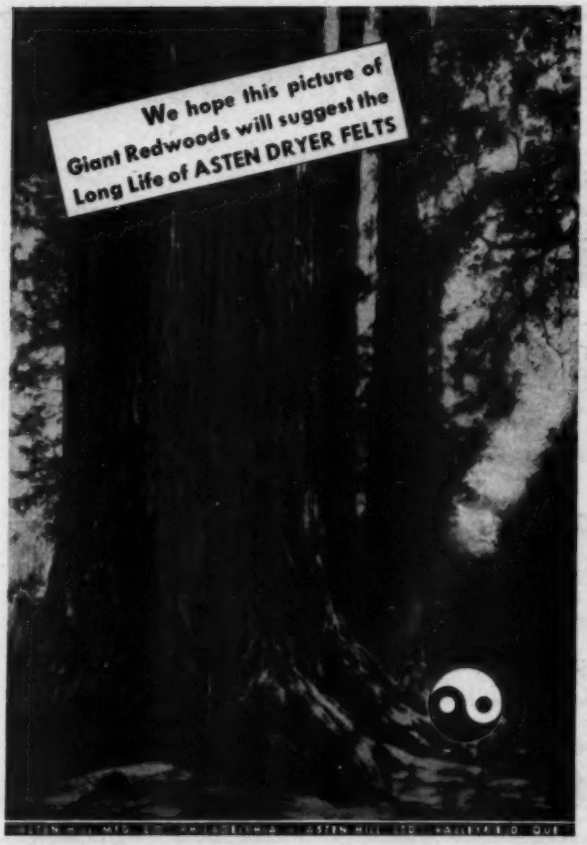
To accomplish this, the digester pressure is reduced by steps instead of at a smooth and uniform rate. In detail, the procedure is to reduce the pressure rapidly for a period of about twelve minutes and then interrupt the blow-down by closing the relief valve and stop all relief for an equal period of time, repeating these steps until the minimum pressure is reached. During the periods of rapid relief, there is a sharp reduction in power input to the circulating pump motor, but during periods of no relief the power consumption returns to almost the same value as during the early part of the cook. The sharp reduction in sulphur consumption by the adoption of the interrupted blowdown procedure brought about, is proof to us that a high average rate of circulation throughout the entire cook is essential to economic cooking.

In passing, it may be well to note the alloy steels that were used originally and those used at the present time. The circulating pumps, which are still in good condition after nine years of service, are of the 23-11 type alloy, and the piping, some of which was replaced after seven years of service, is 18-18 SMO. Strainer rings, which were installed five years ago and show no signs of wear, were fabricated of type 316 alloy and the castings used with these rings are of B & W type 640. Heat exchanger tubes at present are 16-13-3 analysis, but we have used 18-8 SMO tubes with excellent results. In any future equipment for circulation, we would like to use the 317 alloy, as it seems to be somewhat better for this service than any of the other alloys noted above.

The application of time-cycle pressure control is comparatively simple and does not present any difficulties, but this is not so in the case of time-cycle temperature controllers. The reference point or location of the temperature measuring element is vital and must be such that there will be minimum lag and maximum sensitivity.

To fit the definition of an ideal reference point, there is just one location for the temperature measuring element and that is in the piping between the digester and the discharge side of the indirect or direct steam heater as specified by patents of Swanson and Llang. At this point, the velocity is high, insuring good sensitivity, lag is negligible and, as only a small portion of the liquor is being treated at any one time, control is simple and extremely accurate.

Now, the question uppermost in the minds of most operators is what circulating systems mean to us in terms of quality improvements and savings. For any bleachability of pulp produced, pop and fold is 12 per cent higher in the circulated pulp than it was in the conventional quick cooked pulp as well as being more uniform throughout each cook and from cook to cook. For any bleachability, wood density, and acid quality, yield per unit of wood has been increased eight per cent. Production per digester has been increased 30 per cent in a nominal six ton digester and 45 per cent in an eleven ton digester or an increase in plant capacity of 30 per cent in each case, when the cooking time was the same before and after the installation of the systems. Sulphur has been reduced to 184 pounds per ton of unbleached spruce and to 202 pounds per ton of unbleached balsam or hemlock, all of which were cooked to a very low chlorine requirement. Burned lime has been reduced from 165 pounds per ton to 120 pounds and steam consumption is 4400 pounds per ton when using an acid at a temperature of 40 deg. C. We have had steam as low as 3800 lb. per ton, but deliberately sacrificed steam to increase sulphur recovery. Cooking time has been varied from eight to thirty-six hours with no detectable change in either pulp strength tests or strength tests of the paper made with these pulps.



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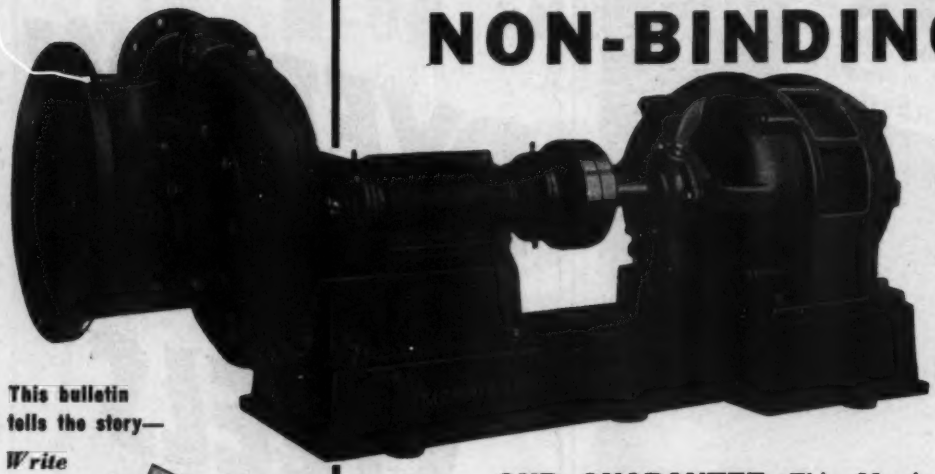

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OUR GUARANTEE—This Morris S T - P Stock Pump is GUARANTEED to handle raw waste paper stock, rag stock, or long-fibre stock without air binding or clogging. The design of this pump is based on 76 years of experience in building centrifugal pumps for every pulp and paper mill service.

Morris Machine Works **Baldwinsville, N. Y.**

MORRIS ST-P STOCK PUMP

Governmental Requirements for Packaging Papers

ERNEST W. SPENCER
Assistant Technical Director
United States Government Printing Office

At the present time there is an increasingly strong trend toward receiving governmental printing papers on skids and this trend is prompted by both economy and convenience in handling.

Since specifying this means of delivery for the larger part of about 120 million pounds of paper now being purchased yearly by the Government Printing Office, we have learned much about its virtues and its vices.

In specifying skids to replace boxes for certain paper deliveries the United States Government Printing Office has not specified the kind of lumber or the kind of construction to be employed. Certain measurements were specified to meet the mechanical requirements of trucks to handle the skids in delivering them to the stores divisions and press rooms. These required measurements pertain to the clearance between the floor and skid platform and the maximum height, length, and width of the skid to facilitate passage through doorways and tier stacking in storage.

The experience has been that but few of the skids received have a sufficient clearance to permit all electric lift and hand-trucks to go freely beneath the skid platform. It, therefore, becomes necessary both in the store rooms and in the press rooms to shimmy up the skids to a greater height by placing strips or chips of wood under the runners before lowering the skid to a resting place. This procedure is not only wasteful of time and labor but very mussy and often dangerous.

Such makeshift methods of building could be easily eliminated by standardizing the selection of wood for skid construction and constructing the skids to standardized dimensions according to the sizes and weights of the papers packaged.

A survey of the general field of packaging reveals no extensive specialized standards for packaging papers.

The U. S. Department of Commerce has made a thorough study of packaging of a large variety of products for foreign shipments. This work has been published as a 1940 revision of Trade Promotion Series—No. 207 by the Bureau of Foreign and Domestic Commerce under the title *Modern Export Packing*, a 530 page cloth bound volume sold by the Superintendent of Documents of the Government Printing Office, Washington. This book may be of interest since it contains illustrated methods of box construction scientifically designed and tested. The methods described are very applicable, in modified form, to packaging papers for domestic commerce.

These studies have been supplemented by other publications of the Government Printing Office issuing from the same bureau. A few of these may here be listed as of pertinent interest.

American Wooden Boxes and Crates—Trade Promotion Series No. 188.

Folding Paper Boxes—Trade Promotion Series No. 205.

Packing for Domestic Shipment—Fiber Containers, Domestic Commerce Series No. 10.

The National Bureau of Standards has also studied certain phases of packaging in the grocery, canning, clothing and other industries. Such studies are published in Miscellaneous Publication M 165 on *Standardization of Packages* as a National Conference on Weights and Measures; and Misc. Pub. M 127 on *Permeability of Membranes to Water Vapor with Special Reference to Packaging Materials*, and several others.

The Book Paper Manufacturers' Association have published *Book Paper Trade Customs* and the Writing Paper Manufacturers Association have compiled *Trade Customs of the Writing Paper Industry.*

These Trade Customs relative to packing and other forms of standardization have been condensed into tabulated form for convenience on Page 122 and following of the 1940-1941 *Printing Year Book and Almanac*, published by Walden, Sons, and Mott, Inc., Printing House Square, New York City.

The United States Government Printing Office specifies the packaging and delivery of paper for its own consumption and for that of the Departmental Services. The printing branches of the Governmental Field Services are not required by law to purchase paper through the Government Printing Office. They do, however, follow closely the same specifications which are drawn up, in collaboration with the Government Printing Office, for Army and Navy schedules and for

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INTERNATIONAL WIRE WORKS

MENASHA, WISCONSIN

the Federal Standard Stock Catalog of the Procurement Division of the U. S. Treasury Department.

These Federal Specifications very closely follow the Government Printing Office Standard for chemical and physical properties, but depart somewhat from the schedule in the packaging and marking of specific types of papers. Packaging on skids, for example, is not specified.

The general Federal requirements for paper packaging are that:

1) All paper unless ordered in rolls or otherwise specified, shall be packed in tight cases so constructed as to insure acceptance by common or other carrier for safe transportation at the lowest rate to the point of delivery. Gross weight shall not exceed 500 pounds. Cases shall be constructed from sound, well-seasoned box lumber, and shall be strapped at both ends with nailed strapping not less than ½ by 0.015 inch.

2) All flat paper shall be put up flat in cases and unless otherwise provided, each ream shall be "slipped" with projecting colored-paper markers. Where the specifications require that the paper be securely banded full width, the width of band shall be full length of the ream and go around the narrow way.

3) Roll paper shall be carefully wrapped; the inner wrapper must be water resistant and the ends well protected, and delivered in good condition. The diameter of the rolls shall be specified in the order. Roll paper intended for ocean shipment shall be packed in tight cases and, if wound on paper cores, the cores shall be protected at both ends with wooden or other suitable material.

Bundle, crate or carton packagings are specified for special kinds of paper such as blotting, tissues, tracings, blue print, etc., under the specification for each commodity.

The requirements to be met in the packaging of paper for governmental use, are not complicated nor abnormally costly and difficult of achievement. In the official proposal for furnishing paper for the public printing and binding and for use of the government department and establishments in the District of Columbia, the specifications and general requirements are simply and clearly stated to prospective bidders.

These requirements are in part as follows:

Packaging—All paper, unless ordered in rolls or on skids or otherwise specified, must be packed in tight wooden cases. Wooden cases must be made from dry lumber not less than 13/16 inch thick provided, however, that the right is reserved to the Public Printer to order for delivery on skids any of the paper covered by the subjoined schedule which may be satisfactorily handled when packed in this manner. The contract price will accordingly be modified by the differential cost of packing in effect at the time of shipment. Where skids are specified in the subjoined schedule or called for under the preceding proviso, they must be substantially made to permit tiering without damage to stock. The clearance under each skid shall be 9 inches. Clearance between runners shall be not less than 28 inches. The over-all dimensions of loaded skids shall not exceed 43 inches in width, 65 inches in length, and 60 inches in height. The ends of rolls shall be well protected. All rolls, except newsprint, must be shipped on their sides. The diameter or weight of the rolls will be specified in the order. This paragraph does not apply to binder's boards.

Weight, Banding, and Marking—All flat paper must be carefully packed; if in wooden cases, the weight should be approximately 600 pounds to the case; if on skids, the weight shall not exceed 3,500 pounds to the skid; if in bundles, the weight must not exceed 175 pounds per package. Cases containing coated book or supercalendered paper must be steel-banded. Where specifications require that the paper be securely banded full width, the band must be the full length of the paper and go around the narrow way. All paper, unless otherwise provided, must be "slipped" with projecting colored-paper marker between each 500 sheets. Direction of grain must be shown on the label in the space provided, whether or not grain is stated in the specifications. This paragraph does not apply to 100 per cent rag chart paper nor to binder's board.

Wrapping—All paper packed in cases, on skids, or in rolls, shall be carefully wrapped. The inner wrapper of rolls and the outer wrapper in cases and skids must be water resistant.

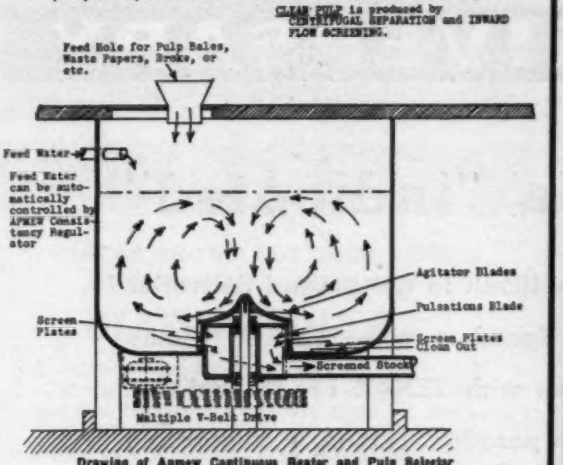
Cores—Where the specifications call for 3-inch cores, all rolls are to be wound on 3-inch *nonreturnable fiber cores* with metal plugs in ends to be furnished by the contractor and weighed in as *tare, except that newsprint cores shall be included as net weight.* Where 6-inch cores are specified all rolls must be wound on *iron* cores to be furnished by the Public Printer, *f.o.b. Washington, D. C.* Cores for the remaking of rejected paper where Government cores are held must be furnished by the contractor at his expense. If, however, it becomes necessary for the Public Printer, in his discretion, to furnish cores to a contractor who has retained cores in rolls of rejected paper, the cost of the extra cores will be deducted from the amount due such contractor, who shall pay all the expense incident to the cartage, freight, etc.

Labels and Memorandums—All skids, cases, bundles, or rolls must be distinctly marked with labels furnished by the Public Printer. Shipping memorandum blanks will be furnished to contractors and must be made out in detail for each invoice and mailed by the manufacturer direct to the Public Printer on the date of shipment.

Carloading—The loading of cars must be by the following method or equal thereto. All paper on skids must be loaded in cars in two separate units, one in each end of the car. Sufficient doorway clearance must be provided to allow unloading by electric lift trucks. Each unit must be bound securely with 1¼ in. x .035 in. steel strapping having a tensile strength of 5,000 lb. Mechanical brakeman plates must be fixed to the floor of the car beneath each unit, through which the steel strapping is threaded. All pressure points of the steel strapping on the skidload must be reinforced and protected with lumber. Where paper rolls are loaded in cars on their sides, such loads must be divided into two or more units and may be single or double decked. Each unit must be bound with 1¼ in. x .035 in. steel strapping. Mechanical brakeman plates must be fixed to the floor, through which the straps are threaded to retard movement of the load.

APMEW CONTINUOUS BEATER AND PULP SELECTOR

(may be operated either BATCH or CONTINUOUS)


CLEAN PULP is produced by CENTRIFUGAL SEPARATION and INWARD FLOW SCREENING.
Feed Hole for Pulp Bales, Waste Papers, Broke, or etc.
Feed Water
Feed Water can be automatically controlled by APMEW Consistency Regulator
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1. LARGE CAPACITY. In one Paper Mill an APMEW Beater is taking the place of three Hollander Beaters and is effecting a yearly power saving of about $9,000.00.
2. CLEAN PULP is produced by CENTRIFUGAL SEPARATION and INWARD FLOW SCREENING. It is the only beater having these features for cleanliness.
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5. IT IS ENTIRELY FREE FROM PLUGGING, thus eliminating all causes of inconvenience, loss of production, and costly shut downs.
6. DEPENDABLE—it is simple in construction, is ruggedly built, and has the finest roller bearings in grease tight housing. It can be tile lined (or optional at extra cost, the tank can be made of Tile, or Stainless Steel, or other suitable materials).
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Have you a slime removal job in your mill? If so, then one moment, please! Oakite cleaning wants that job! Because Oakite cleaning will prove to you what more and more mills are discovering daily . . . that the easiest, most effective and economical way to cure slime troubles is the dependable, low-cost Oakite way.

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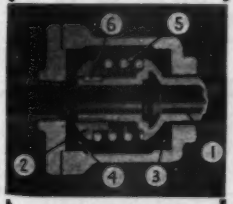

Johnson Rotary Pressure Joint

● Nipple (1) fastened to roll. Sliding collar (2), keyed (6) to nipple. Carbon graphite seal ring (3) and bearing ring (4) eliminate oiling and packing. Spring (5) is for initial seating only—in operation joint is pressure sealed. Note how ball and socket joints at rings provide angular flexibility — how space between nipple and housing allows lateral movement, and also keeps syphon pipe from rubbing on dryer journals.

WHEN Johnson Joints go in, all your steam fit troubles go out. For this modern, packless "stuffing box" never needs to be oiled or repacked, adjusts itself automatically for varying pressures, and even absorbs lateral and angular misalignment without loss of operating efficiency. It stops the endless servicing demanded by the old style steam fits—saves valuable production time that is wasted when machines are shut down to repack or replace steam fits. No wonder users report that the Johnson Joint quickly pays for itself.

In the light of such important savings, don't you think it's wise to examine your own steam fits? You might coax a few more years of service out of them with enough tinkering. But the money you spend for that maintenance alone would very likely pay the cost of switching over to Johnson Joints now.

WRITE for new Bulletin which shows a size and style of the Johnson Joint to fit every paper machine, calender or corrugator.

Use the Johnson Electrap

● Today's highest development in a trap for pumping or lifting service, and for draining systems under vacua as complete as 27" of mercury. Electric operation removes stuffing boxes, floats and all other moving parts from the trap chamber, makes operation as dependable as the flow of electricity. Control valve gear is one compact assembly—can be brought out to any convenient location if trap chamber must be mounted in inaccessible position. Ask for new bulletin.

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"Non-Users Are The Losers"

LOCKPORT FELT COMPANY

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In these instructions all details are left to the liberal interpretation of those who package the paper. Here variations in shipments enter in due to the personal equation.

Some working suggestions might here be tentatively proposed for improving the construction of skids.

1) They might be fabricated of more uniform waste lumber. Without additional cost better selection of materials for the purpose might be made.

2) Economy could be effected in construction by using lighter lumber than 2x4 in. timber in building the top crate for the skid. Unless these strips run the short way of the skid, as they seldom do, the problem of stacking in tiers in the warehouse is complicated, because the runners of the top skid do not fit the top of the skid beneath. To make the upper skid stand level it is often necessary to place a home-made wooden platform on top of the supporting paper skids.

3) Storage and handling would be greatly facilitated if the runners were, for heavy loads, made of solid 4x10 in. lumber running the long dimension of the skid and offset about 4 to 6 inches from the edge of the bed platform. This construction would aid in carrying the heavy paper load without sagging in the middle of the platform. Such a pattern would also greatly assist stacking the skids with proper stability and safety in double tiers, one upon another. A separation of 28 inches between these runners would be sufficient for the introduction of lift trucks.

4) Platforms made of thin lumber double laid should be laid with the boards crossed at right angles to obtain greater strength for supporting the paper stock without sagging.

5) The manner of applying metal bands could be improved upon and standardized to obtain greater effectiveness in strengthening the load with the expenditure of less material and effort.

6) The protection of the four corners of the skid pile with lumber nailed to the top and bottom platforms is unnecessary and wasteful. A right angle bend made in a strip of fiber board of the proper weight offers greater protection to the paper edges and is more effective in easily handling skids.

7) The building of discontinuous runners and runners of thin ½ inch boards either vertically or horizontally tied together with nails is wasteful and dangerous practice. Most of the injuries to paper in transit and in storage are attributable directly to this faulty construction of skid supports. When jostled by the heavy electric trucks, such skids often lean from broken runners, or completely topple over and spill the paper, causing considerable loss in material and labor costs.

8) Economy could be effected in shipping by standardizing the height and weight of certain papers stacked on skids. With more uniform loading of the skids more paper could be shipped in the same car with fewer skids. This is particularly true of 100 per cent rag stocks which could be stacked considerably higher without danger of damage.

9) Small sizes of flat papers in double piles on the same skid should be placed on particularly rigid platforms to prevent spilling or damage to the edges of the sheets when the piles are separated or rocked together by the lifting force applied beneath the center of the skid.

In the construction of boxes, concerning which there has been but little cause for complaint, much scientific study has been given by other Government Bureaus to obtaining optimum results in the protection of products during transportation.

I would like to call your attention to certain scientific packaging studies made by the United States Department of Commerce in collaboration with the National Wooden Box Association, Barr Building, Washington, D. C., and the Wooden Box Institute, Call Building, San Francisco, California, and the United States Forest Products Laboratory at Madison, Wisconsin, and published in their volume on *Modern Export Packing—1940.*

These organizations have made available much practical information gleaned from years of study and experimentation, which will be furnished without charge to those seeking to solve special problems or to improve their standard containers.

While on the subject of wooden box construction for paper shipments, an interesting side-light may be thrown upon the selection of lumber.

Not long ago our laboratory was called upon by the printing division of another government department to solve the mystery of small perforating holes occurring in sheets of their high-grade map-printing papers delivered in sealed wooden cases.

Our investigation revealed that the boxes in which the paper was packed had been fabricated from lumber from which the true

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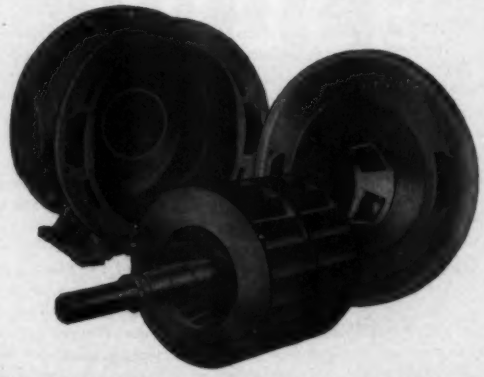

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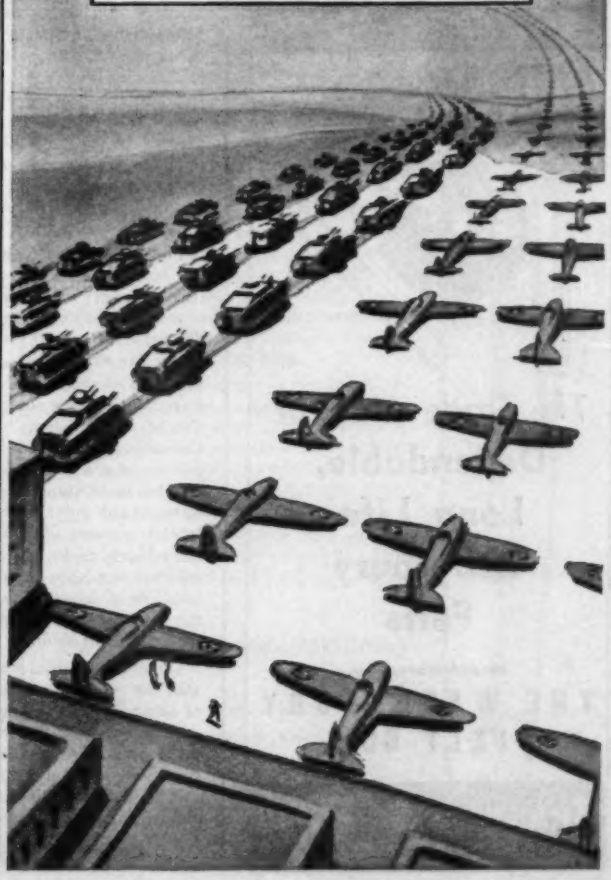

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bark had not been entirely removed. Possibly this was some of the inexpensive wood left in the wake of a recent New England hurricane. However that may be, it proved to be very expensive lumber in the final analysis. We discovered that the perforations in this paper, usually extending completely through the case, were made by a little insect *(Ernobius mollis)*.

May I add just a word about standardization in marking and labeling packages for delivery to the Government Printing Office in Washington.

The proper standard forms for box and skid markings are furnished by the Public Printer to all shippers of all paper. If the supply is getting low it can be replenished upon request.

This is the eighth installment of abridgments of papers presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, held in New York City, February 17-20, 1941. Previous installments appeared in the March, April, May, June, July, August and September issues, and will be continued until abridgments of all available papers presented at this meeting have been published.

The Relation of the Chemical Composition of Filler Pulps and the Color of White Urea Formaldehyde Plastics

GEORGE W. INGLE[1] and HARRY F. LEWIS[2]

The principal object of this work was to determine the relation, if any, between the chemical constituents of the pulp filler and the initial color (yellowness) of the molded white translucent urea formaldehyde plastic. Problems directly related to this basic study were the determination of the specifications of pulps suitable for use as fillers in such plastics; the development of a simple qualifying test for such pulps; the investigation of commercially feasible methods, if any, for sufficiently improving low quality pulps to permit their use as fillers for this type of plastic; the fundamental examination of an available commercial colorimetric method of testing the suitability of such pulps, and the determination of the color-responsible constituents of quality pulps.

The urea formaldehyde resin was prepared in the laboratory in small quantities as needed, under carefully controlled conditions. A solution of 50 grams of urea in 100 grams of neutral formaldehyde was sufficient for fifteen molded discs. After the urea was dissolved, the *p*H of the solution was adjusted to the neutral point by the addition of dilute sodium hydroxide, using the Cameron (glass electrode) *p*H meter. The solution was heated to boiling as rapidly as possible in a round-bottom flask under a water-cooled reflux condenser and refluxed for 1.5 minutes, after which it was cooled immediately to 30 deg. C. The *p*H of the solution was then adjusted to 4.5 by the addition of dilute chloracetic acid, so that the *p*H of the dried pulp pad impregnated with resin was about 6.

Circular pulp discs were then impregnated with the resin solution to produce a mixture of about 40 per cent pulp and 60 per cent resin after drying in a vacuum oven. These dried pulp-resin mixtures were molded in a simple circular overflow flash mold under standardized conditions. Plastic discs were molded from unextracted pulps, from pulps extracted with acidulated alcohol until free of wood resin, and from pulps extracted with hot 1 per cent sodium hydroxide.

A series of pulps of varied quality was used in this study; cotton linters prepared in lap form; a purified sulphite pulp; another sulphite pulp more highly purified, an eastern bleached sulphite, a western bleached sulphite, a purified bleached kraft, a northern bleached kraft, a bleached soda, and a pulp sample labelled as satisfactory by a urea plastics manufacturer (which was found by analysis to be purified sulphite).

To characterize completely the quality of these pulps used as fillers, the following analyses were made, according to the methods of The Institute of Paper Chemistry: alpha-, beta-, and gamma-celluloses, 1 per cent sodium hydroxide solubility, copper number, cuprammonium disperse viscosity, pentosans, ash and wood resin contents, and hot water and alcohol-benzene solubilities. Pulps extracted with 1 per cent caustic and with alcohol-benzene mixture were reserved for yellowness measurements, as were the extracts themselves.

The yellowness of all materials—molded plastic discs, wet and dry pulp handsheets, and pulp extracts—was calculated from reflectance or transmission curves determined by the General Electric recording spectrophotometer.

When the various analytical results were related to the yellowness of the plastics containing unextracted pulp fillers, a close direct correlation of the alpha-cellulose content (or beta- plus gamma-cellulose content) and the 1 per cent caustic solubility with the yellowness of the molded plastics was found. This indicates that the predominating factor in the color relationship was the extent to which the pulp had been freed from hemicelluloses and from the degradation products of cellulose and the hemicellulose, such as result from cooking and bleaching. The complete break-down of these materials by heat and pressure of the curing operation must, then, be sufficient to produce yellowness in the molded plastic. All determinations which vary in the inverse direction to the alpha-cellulose content—such as copper number, hot water solubility, and pentosans—showed, therefore, a rough relationship with yellowness. The cuprammonium disperse viscosity showed no correlation with yellowness. The

(1) Monsanto Chemical Company; (2) Dean, The Institute of Paper Chemistry.

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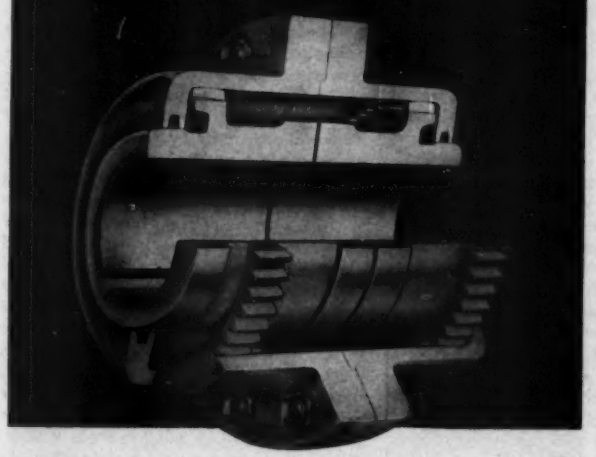

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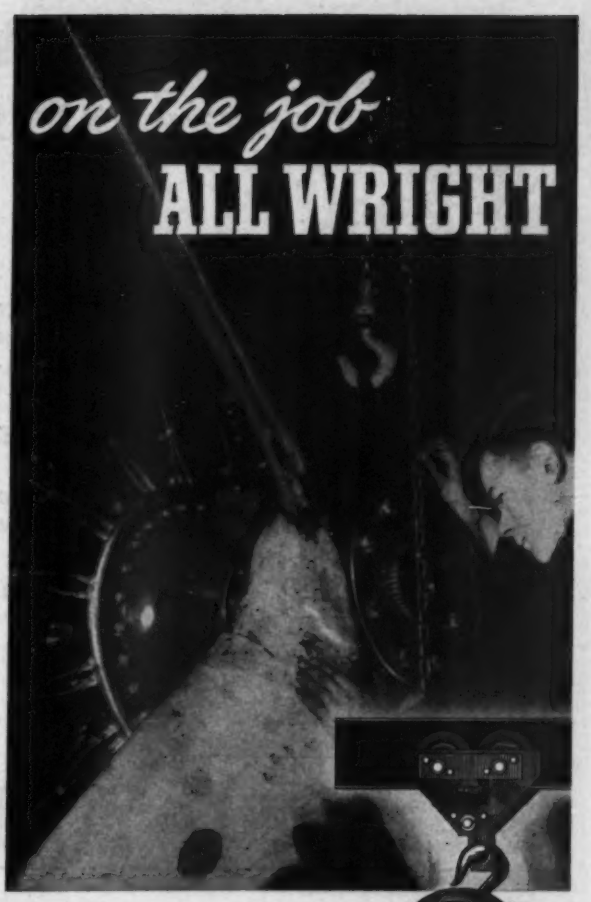

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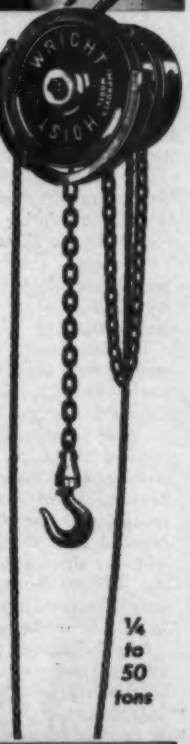

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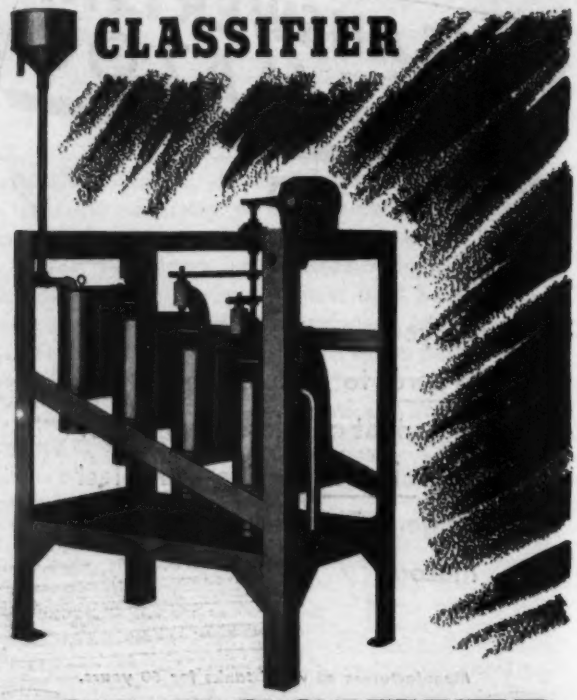

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1 per cent sodium hydroxide solubility, a test particularly adapted to measuring the hemicelluloses and the degradation products of cellulose and the hemicelluloses, and chemically similar to alpha treatment, correlated with yellowness over the entire range of the pulps studied.

The wood resin content and alcohol-benzene solubility were found to be important in the coloring of the molded plastic only when the alpha-cellulose content was 90 per cent or more; higher proportions of degraded celluloses must obscure the discoloring effect of wood resins and tannins as they occurred in these paper pulps.

The fair degree of correlation found to exist between the yellowness of the molded plastic and that of the wet filler pulps suggested that the latter might be related to those constituents responsible for the color of the plastic discs. As in the case of the plastics, the wet color correlated best with the alpha-cellulose content; the correlation with the other analyses would be expected from the general inverse relation with the alpha-cellulose content. As with the plastics, the wood-resin content was insignificant in this color relation, except in the case of the better quality pulps.

The brightness and yellowness of the molded plastics were found to be mutually independent, so that the brightness must be independent of all measures of the degree of degradation used in this study. In addition, the brightness of the plastics was not related to that of the pulp fillers; however, there seemed to be a definite inverse relation between plastic and brightness and the ash content of the filler. In each case, plastic containing fillers previously extracted with hot 1 per cent caustic and with acidulated alcohol were brighter than those with unextracted pulp fillers; this was particularly noticeable with pulps of originally higher ash contents, effectually lowered by the extraction processes.

In the course of the pulp analyses it was noticed that the color of the hot 1 per cent caustic extracts was apparently directly related to the color of the molded plastics containing these pulps as fillers and, incidentally, to the 1 per cent caustic solubility. This was established quantitatively through measurements of the color of these extracts.

From these results we may conclude that either of the two general commercial methods of alpha treatment will increase the suitability of a pulp filler for white translucent urea plastics; furthermore, that specifications for pulps suitable for use as fillers in this type of plastic should include a minimum degree of degradation, and in the highest quality pulps, a minimum percentage of extractives. Based upon the results of analyses of a commercially acceptable pulp filler, these characteristics are satisfied by a pulp having a minimum alpha-cellulose content of 87.5 per cent, a maximum pentosan content of 4.0 per cent, a maximum 1 per cent sodium hydroxide solubility of 4.0 per cent, and a maximum wood-resin content of 0.2 per cent. By using a pulp filler having these specifications, the yellowness of white translucent ureaformaldehyde molded materials should be kept above the desirable minimum.

The Use of Bleachability Tests in the Marketing of Pulp

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There are many chemical tests that can be applied to wood pulp for the determination of its characteristics. We have, today, sufficient procedures to analyze almost completely any particular type. These tests include bleachability by several procedures, copper number, alpha content, pentosan content, lignin, noncellulosic impurities and many empirical procedures confined to one or two plants. These, however, narrow down to several when their use is restricted to pulp for the manufacture of paper. The only chemical tests commonly in use for grading purchased pulp today are those for bleachability and copper number and the former far outranks the latter. Even so, this determination of chemical characteristics, outside of mills producing pulp, is fairly recent, having only been in practice on the buying and grading end for about 8 to 10 years. Prior to that time, pulp quality was determined entirely by physical tests such as Mullen, tear, fold and freeness. Even this was not general as many small mills did not possess the necessary laboratory equipment and others were convinced that the information forthcoming from the laboratory was not of any value. Pulp was purchased by the buyer principally on the reputation of the mill that produced it and

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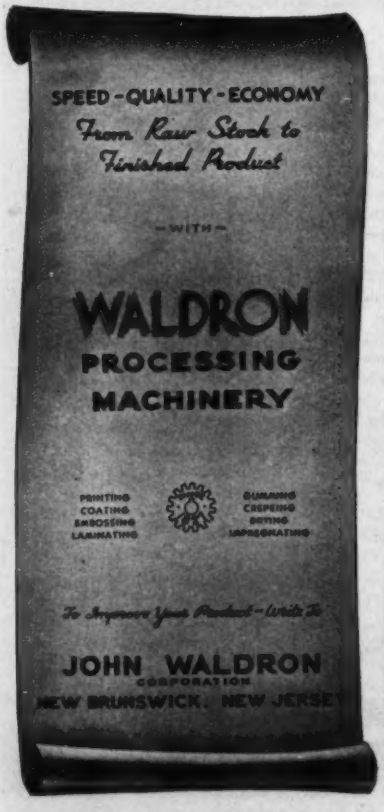

as it became known to him through actual conversion into paper.

Pulps had been classified as strong, prime strong, prime special, second quality, or easy bleaching with all sorts of number and letter combinations to designate a particular group of characteristics. The words "prime" and "strong" meant the best grade of pulp that any particular mill made and had no meaning at all in comparison with the prime or strong pulps from another mill. A prime strong pulp from mill A might not be at all comparable to the prime strong pulp from mill B. Nevertheless, both of them bore the same name and the tendency was to place them in the same category. They might be differentiated a little further in some cases by saying that one was a soft pulp and that the other was hard. This was confusing in that the word "hard" did not necessarily mean that the pulp was hard itself, in the usual meaning of the word, or that it produced hard papers or that it was hard to beat off, it meant different things to different people and one had to guess what any particular buyer might mean by the word "hard." The same thing applied to "soft."

Today, in discussing any pulp or any particular quality of a pulp, the words "hard," "soft," and "strong" are still used but they are confined and limited by various descriptions of their bleachability. Right along with these words, other adjectives such as "easy bleaching" and "bleachable" have come into use and growing up with this has come a classification of use requirements largely by the per cent bleachability. For example, strong domestic pulps will have bleachabilities ranging from 20 down to 17, the bleachable grade will run from 17 down to 14 and the easy bleaching from 14 as low as 10. It should be mentioned here that these bleachabilities refer strictly to American West Coast pulp. Scandinavian pulps in the same classifications, that is, strong, bleachable and easy bleaching will run considerably higher in per cent bleachability. It is not uncommon to have Scandinavian pulps in the bleachable range with bleachabilities as high as 22 to 25.

In discussing the use requirements of the pulp, there is taken into consideration whether it is to be used as a straight unbleached or whether it is to be bleached in the paper mill. If the pulp is to be used as a straight unbleached, the bleachability is used as a guide for strength and resistance to beating. We have learned that a pulp with a bleachability of about 17 will have greater strengths than one of 14 and will take on water of hydration faster. If the mill is not equipped to beat the pulp properly and to get out of it the potential strength that is there, they must sacrifice some part of the potential strength and move down to a bleachability in the neighborhood of 15. This middle range, that is, around 15, has been found to be the one quality which will satisfy the broadest range of requirements. This pulp can be used in book paper, paper boards, or a wide range of specialties. In certain grades of groundwood papers where the fiber must be kept as free as possible, it is necessary to go as low in bleachability as 10 or 11. If the pulp is to be bleached in the paper mill, a new set of requirements must be considered, the foremost of these being the amount of chlorine required to get a good commercial white. Most mills are satisfied if this figure is in the neighborhood of 5 per cent chlorine and this figures into a bleachability percentage of approximately 15½.

It is quite possible to have two pulps of the same bleachability but with different strength characteristics. This might be due to the wood, or some change in acid concentration or cooking cycle. This is no deterrent to the scheme of using bleachability but is really an adjunct, for if the two pulps have the same bleachability but different strengths it is one further means of differentiating between them. At the pulp mill, strength tests as well as bleachability tests are made and pulp is picked on the basis of both tests. When one mill is shipping pulp to 100 or 120 different customers and is forced to maintain a standard of uniformity in each of the customers' mills it is absolutely necessary to have both the strength tests and the bleachability test.

The foregoing refers wholly to unbleached and recently we have noticed a tendency to use a test on bleached sulphite to accomplish the same ends. This test is the copper number which, instead of measuring the oxidizable materials in the pulp, measures the reducing materials. While the bleachability tests measure, to a certain extent, purification, the copper number measures degradation since it reflects the amount of oxycellulose formed during the bleaching process. Information available concerning the relationship between the copper number of a pulp and its other characteristics is lacking to a large extent and is being developed currently. I do not mean to infer that the copper number is being widely used on bleached sulphites in the way that bleachability tests are used on unbleached sulphites. In the past four years, I can recall only three instances where the copper number was used at all.

For further work along these lines, I would like to recommend investigation into the influence of pentosan content on pulps and how to maintain the pentosans in the pulp during the cooking. Enough information has been developed on this subject to be very interesting. For example, the addition of as little as 2 per cent of synthetic pentosans will completely change the beating characteristics of a pulp. No matter what you may have with reference to strength tests and bleachability, if the pentosan content should change, the other tests are meaningless.

We have found through experience and rule of thumb that the higher the pentosan content the more satisfactory are results obtained in the production of glassines, greaseproofs and other highly beaten papers. We have learned enough to feel that one of the major differences between the American pulps from the West Coast and the Scandinavian pulps is in their pentosan contents and that the major difference between the old fashioned Mitscherlich cooked pulp and the modern indirect cooked pulp is the pentosan content. This is probably the reason these pulps in the same classes will run to higher bleachabilities than the West Coast product.

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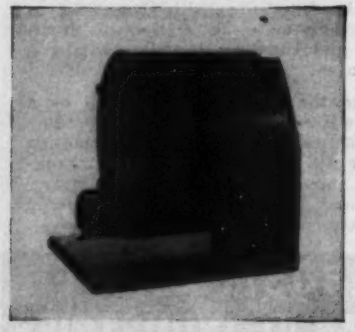


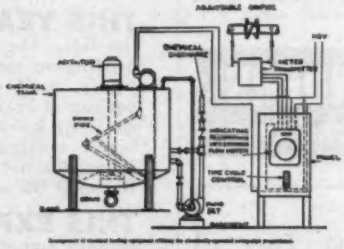
ing current generator and a voltmeter of the rectifier type. The generator is of the permanent magnet, a-c inductor type, the magnets being made of carefully aged, high grade magnet steel.

The rotating element consists of laminated iron keyed to a rust resisting steel shaft. Laminations are slotted to permit variation of the air gap reluctance when the shaft is rotated. This in turn varies the flux linking the voltage coils and induces an alternating voltage in the coils. The alternating voltage is rectified by a Rectox unit in the voltmeter calibrated in r.p.m., feet per hour, or other unit depending on the application.

The manufacturer recommends the tachometer for operation over a range of from zero to 5000 r.p.m., stating that its overall accuracy is minus ½ per cent of full scale.

Proportional Chemical Feeder

An electrically-operated chemical proportioner, developed particularly for proportioning a number of individual chemicals to water conditioning systems in accordance with makeup requirements, has been announced by Cochrane Corp., 17th St. &



Allegheny Ave., Philadelphia. In this equipment, a swing-pipe chemical proportioner is controlled from a Cochrane electric flow meter provided with contacts on the integrator train. When the predetermined quantity of water has passed through the meter orifice, the integrator closes a contact in the electrical circuit, including a time cycle relay. Time for which the porportioning motor is to run is controlled from a panel-front knob for each chemical.

Plasticizer for Paper Coatings

Glyco Products Co., Inc., 230 King St., Brooklyn, N. Y., has announced a plasticizer for use with paper coatings to render them more flexible and to give them greater adhesiveness. This plasticizer, designated as S-376, can be stirred directly into the coating mix. The final dispersion, according to the manufacturer, remains stable; improves the calendering operation; and produces coated sheets with greater water resistance.

Uniform Tension Unwinder

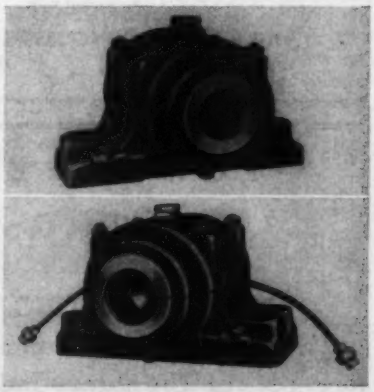
The Johnstone Engineering & Machine Co., Downingtown, Pa., has announced an unwinder which is designed to maintain a continuous uniform tension on a web of paper being unwound from a parent roll. A nerve roll and a hydraulic brake, automatically operated and co-ordinated by an oil-filled bellows and piping system (designated as the *Tensioneer*), constitute the more unusual features of design. In the operation of the unwinder, a loop in the travelling web pulls the nerve roll in the opposite direction to the pull of the springs or weights on the roll, any variation

in tension on the web causing the nerve roll to move forward or back in its horizontal tracks. Movement of the nerve roll is transmitted to the brake by the *Tensioneer*, thus automatically releasing or applying friction to maintain the desired tension in the web. The brake controls the unwinding roll; and the physical condition of the unwinding roll controls the brake.

Air-cooled brakes are used on the unwinder when handling light and medium weight papers; watercooled brakes, when handling boards up to 20 points in thickness. Standard machines take rolls from 32 in. to 92 in. wide. The maximum operating speed for the air-cooled type of unwinder is 700 fpm.; for the watercooled type, 1500 or 2000 fpm.

New Pillow Block

Dodge Manufacturing Corp., Mishawaka, Ind., has announced the *Sleevoil Precision Pillow Block*. This pillow block is designed for a wide range of industrial applications where a high grade babbitted

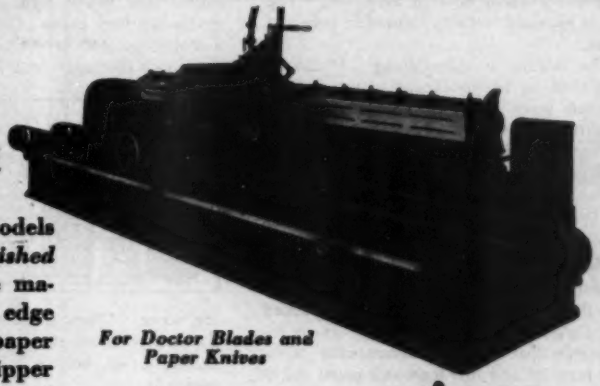


bearing is required. It is made in both plain and watercooled types in shaft sizes from 1 7/16 in. to 8 in. inclusive.

A single "T" section brass oiling ring is used for sizes up to 3 7/16 in. inclusive; two rings are used for the larger sizes. The

KNIFE GRINDING

THE VALUE OF *proved* SUPERIOR SERVICE



For Doctor Blades and Paper Knives

The *promise* in the earlier design of the models here shown, has now become the *established standard* in the latest development of these machines, for strictly precision grinding, keen edge finish, wet or dry grinding of slitter knives, paper knives, doctor blades, barker knives, chipper knives, and all straight or bevel edge grinding, and universal slitter knife service.

• • •

Superior, *proved*, service was never better exemplified than in these two machines, definitely establishing the better grinding standards for slitter knives, paper knives and doctor blades, which are now becoming the standards of the industry through the development and wide adoption of these machines.

Superior, economical, proved. Developed by the pioneers in the industry. Complete catalogue sent free upon request.

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Vacuum PROFIT FACTORS

Net profit on every ton of paper produced in your mill is influenced by the vacuum maintained on your suction, couch or press rolls, and is directly connected with the performance, operating cost and maintenance cost of your vacuum pumps. Each has been a deciding factor in many a choice where "R-C" Cycloidal Vacuum Pumps were selected for important new mills in recent years.

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A complete line of Wood Room equipment, pulp mill flat screens, paper mill windershafts. Our engineering services are available to help you solve your Wood Room, pulp and paper mill problems.

Write for information on our new complete line of wood cleaning equipment and flat screens—equipment designed to meet 1941 requirements.

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base has a drain hole in each end. The cap is provided with an inspection hole and cover.

The bearing is self-aligning. It can be furnished in either expansion or non-expansion types. Sealing against admission of dirt or escape of lubricant is provided by special seals held onto shaft by garter springs. A drain is located at the bottom of the seal grooves to carry oil back to the oil chamber.

Paper Micrometer

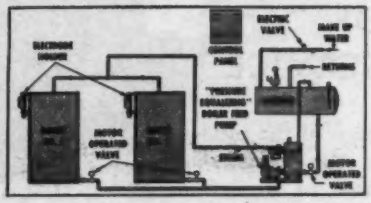
Instrument Specialties Co., Inc., 232 Bergen Blvd., Little Falls, N. J., has announced the *Carson* electronic micrometer as an instrument that makes measurements without pressure and that measures paper thickness accurately to .0001 in. The micrometer consists of a precision micrometer head fitted with a large diameter dial and mounted in a rigid instrument frame. When the micrometer tip is brought into contact with a metallic rider resting upon the paper, a green light indicates the exact

instant of contact before any pressure is exerted on the paper being measured. An electronic circuit sensitive to displacements as small as five-millionths of an inch makes this indication possible. Both a 2½ in. diameter dial with divisions every 0.0001 in., and a 4½ in. diameter dial with divisions every 0.00005 in. are available. The larger dial has a vernier or fine adjustment permitting accurate adjustments to a fraction of a division. The instrument is portable and operates from any 110 volt, 60 cycle current supply.

Multiple Boiler Water Control

Johnson Corp., Three Rivers, Mich., has announced a new system of multiple boiler water control for pressures up to 150 lb. and for boilers up to 250 hp. The system maintains water levels in two or more boilers with one boiler feed pump. Each boiler water level is controlled separately, water being added to one boiler independently of the others as the need arises. The system is electrically controlled, and is completely automatic in operation.

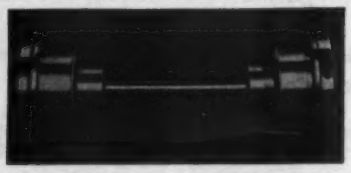
When the water level is any boiler falls below the longer of two electrodes which are mounted in a small holder on each boiler, an electric current is disturbed and which through a relay starts the boiler feed pump. At the same time, a motor-operated valve is opened to divert the pump discharge into the boiler requir-



ing water. When the water input reaches the desired level, the pump stops. When necessary, all boilers can be fed simultaneously.

Floating Shaft Coupling

A coupling for floating shaft requirements, designated as the *Type P-Piloted Coupling*, has been announced by The Falk Corp., Milwaukee, Wis. The coupling is constructed entirely of steel. It consists of two hubs, one of which carries



an integral flange to which the cover is secured, a special tempered steel member forming a complete cylindrical gridmember and flanged steel cover secured to the hub flange with capscrews.

Rubber-Soled, Non-Slip Footwear

Sperry Shoe Co., Industrial Division, 15 Main St., Beacon Falls, Conn., has announced a line of footwear to provide safe footing on slippery floors. This line

makes use of the *Sperry Top-Sider Safety Sole*. The sole is of rubber, it being partially cut through from the bottom side into a series of narrow and immediately successive block-like sections of herring-bone-shaped design. According to the manufacturer, this design of sole combines a squeegee drying action with a tenacious individual grip that is effective even under water.

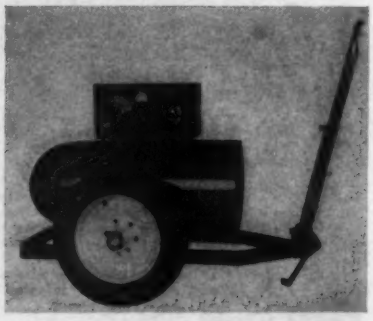
Water- and Dust-Tight Circuit Interrupter

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has announced a new non-automatic enclosed De-ion circuit interrupter which has been designed especially for disconnecting or interrupting of circuits in outdoor, damp, wet, or dusty locations. Current ratings range from 50

to 600 amperes, 2 or 3 poles, at 250 to 650 volts a-c. and 125/250 to 250 volts d-c. A high interrupting capacity is provided to interrupt a circuit adjusted for 5,000 to 10,000 amperes depending on frame size. De-ion arc quenchers confine, divide, and extinguish arcs almost instantly as the contacts open. "Quick make," "quick break" action is obtained by a toggle mechanism operating the contacts.

Welding Machine Trailer

A two-wheeled pneumatic-tired trailer for mounting arc welding machines for portability in shop, yard or on the road has been announced by The Lincoln Electric Co., Cleveland, Ohio. The trailer is designed for mounting either Lincoln SAE



200 to 600 ampere a-c. motor driven or Type SA 200 special engine driven Lincoln arc welders. It is of arc welded steel construction throughout. The unit measures 66 in. long, 42 in. wide, 16 in. high (over tires) and weighs 282 lb. Tires are 16 x 5.50, 4 ply.

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provide protection against excessive wear in the modern Johnstone Slitters and Rewinders. One of the Extra Values—No "extra" in Price. Send for Bulletin No. 241.

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Out of every dollar paid out for the expense of Paper and Pulp Mill accidents, only 1/5th (20c) is covered by Insurance. The remaining 4/5ths (80c) comes out of YOUR pocket in INDIRECT costs.

But when you put National Safety Council Accident Prevention Service to work in your plant it will—when properly applied—cut down the Frequency and Severity of your accidents, and, of course, those 4/5th losses which you have been paying for.

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More and more it is becoming apparent that Taylor Spiral is the paper mills' most versatile pipe. It is the easiest to install in the first place, the easiest to handle when conditions are changed, the most economical to buy and to maintain.

Whether it is a simple layout, or the most intricate layout requiring special fabrications, Taylor Forge has the answer to your piping requirements. Always remember that Taylor Spiral Pipe is about 50% lighter than ordinary wrought steel pipe and over 50% cheaper when installed.

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TAYLOR Spiral PIPE

TECHNICAL DEVELOPMENTS

The following abstracts are of the latest developments found in the foreign press.

Low Temperature Pulp Purification

Orienting experiments led to the following method for preparing the so-called "frost cellulose." Bleached pulp was suspended in 5% aqueous NaOH so as to form a 5% suspension, which was kept at minus 25 C. for 1 hour. The frozen pulp was then allowed to thaw at room temperature, and heated (if required) to 90 C. for 15 minutes, filtered by suction, pressed, water washed, pressed, defibered, washed again, and finally bleached with dilute hydrochlorite (0.3—0.5%). In cold NaOH solution such fibers swell rapidly, increasingly so with decreased temperature. Cross sections of fibers increase 20 times, balloon portions forming which burst, with the fibers breaking at the middle and ends. Such changes occurred only when the fibers were frozen. With rising temperatures, the fibers regained the original dimensions. These properties were not met with on freezing with water (even under pressure) concentrated caustic, and a number of other bases, acids an salt solutions. Frozen cellulose, warmed to 20 C. taken on a leather-like surface and if dried undisturbed, becomes parchment-like. However, agitation during washing, prior to drying, gives rise to an absorbant product, which is soft and pliable. A study was made of the following factors in cold purification of esparto, cotton, soda pulp, and sulphite "frost cellulose;" pulp type, alkali concentration, stock density, length of freezing, and effect of temperature, impregnation degree, kind of thawing, used chemicals added to the alkali (used in freezing) re-use of NaOH, original degree of pulping, refreezing, and the use of chemicals other than NaOH. In all pulp studied, the alpha-cellulose content was higher when the same pulps were subjected to hot purification with less pulp loss. Little degradation resulted from freezing as indicated by slight changes is viscosity. Alpha-cellulose content increased with increasing NaOH concentration as did absorption. Copper numbers decreased. Best results were obtained with 5% NaOH. When pulp consistency increased above 5%, the effects on alpha-cellulose, and chemical and physical characteristics of pulp were unfavorable. Lengthening periods of "freezing" appears to give pulps with higher alpha contents higher viscosities and lower copper numbers. Thorough impregnation prior to freezing improved the "frozen" pulps. It made no definite difference in the pulp when heating subsequent to thawing was carried out at 20 or up to 110 C. Adding various salts to NaOH had no appreciable effect on pulp purification. Reuse of alkali resulted in slightly lower alpha cellulose pulp. Double freezing improved pulp quality. Physical and microscopic examination of pulp showed that the latter was practically unchanged by freezing in the presence of sodium carbonate, $CaCl_2$, NaCl, HCl, NH_4CNS, ammonia, or lime water (in place of NaOH). L. Rys and P. Treka. Zellstoff und Papier. *21*, 6-12, 35-44, 80-4, 112-16 (1941)—through C. A. 35, 4949-4950 (1941).

Morphology of Cereal Straws

This is a continuation of work done at Darmstadt. Microscopic comparisons were made between wheat straw pulp, and pulps prepared from cornstalks, potato tops, and sunflower stalks. Photomicrographs are included (of which two are given here; Figure 1, showing pulp from wheat straw

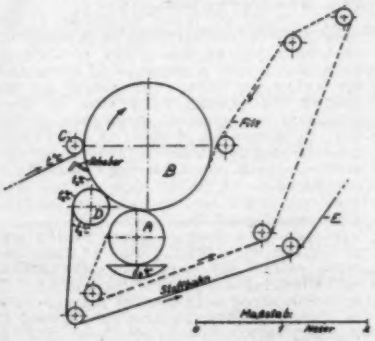
Fig. 1

Fig. 2

and Figure 2, pulp from sunflower stalks). A determination was made of the per cent of epidermal and parenchyma cells, vessels, and fibers. Two different methods of determining the mean fiber length are given. The usual numerical method (i.e., by determination of the number of fibers in individual class intervals given in terms of the percentage of the total number of fibers) appears less significant than does the new method, the so-called "längemässige" mean fiber lengths (which the length in a class interval is given in terms of percentage of the total length) details of which are reserved for a future publication. In general this second figure is approximately twice that of the first (in the examples cited). In the straw pulps studies, 52.2% of the total number of cells were fibers. Width as well as length measurements were made. However, physical and chemical differences in a specific pulp type appear to influence strength properties more than do fiber length differences. G. Jayme and M. Harders—Steinhaüser. Papier-Fabr. 39, 89-93 (1941). (For an abstract of the first paper of this series, cf. THE PAPER INDUSTRY AND PAPER WORLD, April, 1941, p. 86).

Heat Economy of a Pulp Hot Press

The author outlines the advantages of a hot press such as that schematically shown in Figure 1. Here the felt is shown as "Filz" and the pulp web is termed "Stoffbahn." The lower press roll is A, (diam. 650 mm. width 2650 mm.). The large upper press roll, B (1500 mm. diam.) is steam heated and may be raised and lowered. By means of charging with various weights, the line pressure may be raised in stages from 80 to 136 kg/cm. The press roll "C" presses the web against B. The sheet does not leave the hot press until the "ironing" roll (Bugelwalze) D has



pressed the sheet with a line pressure of 30-40-kg/cm. By heating the stock from 30 C. up to 70 C. a saving of about 11% steam is effected at the dry end of the machine. Before pressing, evaporation in the pulp web is very slight. It occurs only after leaving the hot roll. The importance of D (above) has not been developed. The hot press occupies little more room than would an ordinary third press, and is capable of markedly increasing the temperature of, and the pressure upon the moving pulp web, without much intermediate cooling or evaporation. Finn Blikstad. Papier-Fabr. 39, 81-6 (1941).

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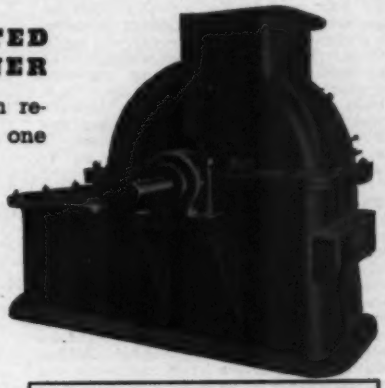

SEND US PREPAID NOT EXCEEDING 100 LB. SAMPLE OF YOUR PRESENT STOCK.—Also a sample of your Present Finished Stock to us for testing purposes.

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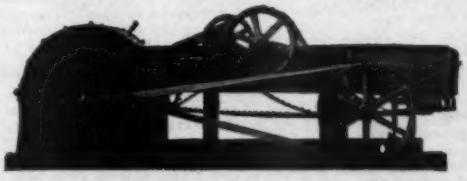

This sturdy Shredder has the Automatic Feed Table for handling of straw, waste paper, also successfully used for recutting of rags from style cutter, lowering the time of beating—prepares products for large capacity feed to refiners, beaters or digesters

For trouble free continuous service, select the Gruendler Shredder.

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The Gruendler Knifeless Wood Hog is outstanding in the handling of bark, oversize chips—log cores, etc.

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Offices in Principal Cities

New Catalogues, Ass'n Reports, and Publications

Allis-Chalmers Mfg. Co., Milwaukee, Wis.—A news-sheet, "Defense Production News", will be published monthly by this company showing the part that it is playing in the national defense picture. The first of this series has just been issued. The publication explains the current stress for the production of materials for defense. News stories and pictures of the various products manufactured by the company are also included.

American Brake Shoe & Foundry Co., Chicago Heights, Ill. — The American Manganese Steel Division of this company has just issued a publication on Amsco welding products. Many illustrations are used showing the various applications. The booklet also contains an alphabetical listing of many products together with the type of Amsco that should be used in welding it. Dieweld, a metal used for Amsco filler bars and shapes, repointers and wedge bars, is also discussed and illustrated as to application.

The American Leather Belting Association, New York City—This Association recently distributed to all manufacturers, distributors, and salesmen of leather belting a very attractive spiral bound book, done in color. The fine de luxe piece is part of a campaign to familiarize those connected with the leather belting industry with some of the things being done by that industry to re-establish leather belting as one of the basic media for the transmission of industrial power. The data and other information incorporated in this book have been so well presented and laid out that it invites perusal.

Brown Instrument Co., Philadelphia—Technical and comprehensive information on the Desuperheater Control System and the control accessories for pneumatic controllers has just been published in two booklets. The first (Bulletin No. 29-33) deals with the Desuperheater Control System, the history, a description of the unit, its characteristics, and application data. Also included are three full-page diagrams of each of the different forms. The second (Bulletin No. 89-14) is outstanding because of the profuse use of charts and diagrams to explain the features and uses of accessories for controllers.

Cameron Machine Co., Brooklyn, N. Y. —A folder-type publication giving the story of constant web tension control and the photo-electric side register control on the winding and rewinding of paper has just been published. Three types of the constant tension controls are illustrated and described briefly. Two illustrations of different type scanning heads are included with a description of each.

Carrier Corp., Syracuse, N. Y.—"Non-freeze Unit Heaters" is a new publication illustrating three methods of economy through use of unit heating. The wide application of this heating unit in every industrial and commercial heating installation whether outside air is introduced or inside air is recirculated is pointed out. Tables, diagrams, and charts are used extensively showing the various features and principles of the unit.

Cochrane Corp., Philadelphia — Four different Deaerators are explained and discussed in detail in a new publication entitled "Cochrane Deaerators." They are: the tray-type deaerator, the atomising deaerator, the hot water generators and deaerators, and cold water deaerators. The extensive use of illustrations, the diagrams showing the features, the operating principle, and the various parts of the machine are the outstanding features of the publication. A supplementary appendix explains corrosion control and pH control.

Fairbanks, Morse & Co., Chicago — A simple and fundamental description of electrical phenomena is well-presented in a new 48-page book entitled "Catechism of Electrical Machinery." Working from the simple to the more complicated the book starts by describing the electricity and magnetism as utilized by electric generators and motors. The principles of direct current generators and motors are explained, followed by an examination of alternators and alternating current motors. Photographs, simplified diagrams, and illustrations are used to aid in presenting a clear picture.

B. F. Goodrich Co., Akron, Ohio—A booklet devoted entirely to the subject of Ameripol D synthetic rubber has just been released. Three tables are included. The first compares the properties of Ameripol in 33 specific respects, starting with workability and ending with resistance to paint and ink dryers; the second table lists the properties of typical Ameripol D vulcanized compounds; and the third gives the per cent of volume increase after 48 hours immersion of natural rubber and two other types of synthetic rubber as compared with Ameripol D. The booklet is well-illustrated.

D. W. Haering & Co., Inc., Chicago—Extensive treatment is given the subject of scale, corrosion, and living organisms in cooling system operation in a new booklet. Some of the subjects covered in this booklet are: experimental methods of studying cooling system problems; discussion of the causes and prevention of corrosion of both steel and copper alloys; and microbiological deposits. The booklet is profusely illustrated and many charts and tables are used.

Hays Corp., Michigan City, Ind.—The What, Where, How, and Why of furnace draft are discussed in detail in a new publication just issued. Many diagrams are used to explain the various problems concerning draft. One section of the booklet is devoted to the draft gauge and how it operates, together with information on the selection of the proper gauge to suit the requirements. The installation of draft gauges is also given careful consideration, using diagrams to explain the written material.

The Jeffrey Mfg. Co., Columbus, Ohio—Three new booklets have just been sent out by this company. The first is concerned with portable belt conveyors, the second with portable scraper conveyors, and the third on portable bucket loaders. All of these publications are profusely illustrated and describe each piece of equipment in detail with charts and diagrams. Specifications for the various size machines are included in each one.

Leeds & Northrup Co., Philadelphia—"To Hold Paper Stock at Specified pH" is the title of a new 16-page booklet describing the equipment necessary to keep paper stock at a specified pH by regulating the addition of reagent. The booklet is well-illustrated showing the various pieces of machinery, and also includes charts and diagrams showing the results of using this equipment. A page of the booklet is devoted to reproducing in part some of the letters received from users. This is Bulletin N-96-709D.

R. W. Rhoades Metaline Co., Inc., Long Island City, N. Y.—A new catalogue has just been published on Metaline Bronze Bearings. It is arranged in three sections; the first describes the lubricating properties of Metaline, the second part outlines the various types and the range of application for oilless bearings, and the third deals with detailed data for use in preparing specifications.

Towmotor Co., Cleveland, Ohio—Specifications on the seven models of gasoline powered lift trucks with capacities from 2000 to 10,000 pounds are described in detail in a new 26-page bulletin. A summary of the advantages of the Towmotor Unitload is also included. Each page discusses one problem of industrial handling with a large illustration of the problem.

Westinghouse Electric and Manufacturing Co., East Pittsburgh—A new bulletin has just been announced which describes capacitors for outdoor mounting. Capacitors with ratings from 2½ to 180-kva, 230 to 4160 volts, for outdoor mountings on poles or cross arms are described. Application, distinctive features, and construction details are discussed, with special attention being given to discharge devices, terminal bushings, and overcurrent protection. Complete information on mounting methods and brackets is given and illustrated with diagrams of typical installations. Drawings give the physical dimensions of the common sizes and tables give ratings, weights, and styles.

Worthington Pump and Machinery Corp., Harrison, N. J. — Comprehensive treatment is given the subject of DD diesel engines in a new 8-page booklet just sent out. A large, labeled diagram points out some of the features of the engine and explains each briefly. A more complete description of the features is given under the heading of specifications, and each individual mechanism is given consideration; the frame, main bearings, the crankshaft, etc. Many illustrations and charts are used.

Association Reports

Newsprint Statistics—August production figures released by the News Print Service Bureau on September 13, show that production in Canada during August, 1941, amounted to 293,054 tons and shipments to 296,985 tons. Production in the United States was 83,592 tons and shipments 80,756 tons, making a total United States and Canada newsprint production of 376,646 tons and shipments of 377,741 tons. During August, 30,853 tons of newsprint were made in Newfoundland, so that the total North American production for the month amounted to 407,499 tons. Total production in August, 1940, was 434,964 tons.

The Canadian mills produced 83,612 tons less in the first eight months of 1941 than in the first eight months of 1940, which was a decrease of three and six-tenths per cent. The output in the United States was 3,704 tons or five-tenths of one per cent more than in the first eight months of 1940; in Newfoundland production was 2,613 tons or one and one-tenth per cent more, making a net decrease of 77,295 tons, or two and four-tenths per cent less than in the first eight months of 1940.

Stocks of newsprint paper at the end of August were 155,214 tons at Canadian mills and 13,459 tons at United States mills, making a combined total of 168,673 tons compared with 169,768 tons on July 31, 1941, and 178,935 tons at the end of August, 1940.

Books

The Paper Trade Diary Directory of Great Britain, India and the Dominions (1941)—This combined diary and directory in the 55th year of issue has made its appearance. Pocket-size and bound in flexible cover, the book is priced at 3/- net by Trade Journals Limited, 8 Baldwins Gardens, London, E. C. 1, England. In addition to the information given about the mills covered by the title, the book also contains considerable other data, including information on paper trade customs, trade associations, manufacturers of paper making machinery and accessories, china clay producers and merchants, pulp and esparto merchants, manufacturers of paper makers chemicals, and watermarks.

Heppenstall E.I.S. Alloy Steel Knives are *Guaranteed*

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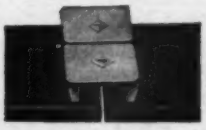
TRIMBEY MACHINE WORKS
GLENS FALLS N.Y.
PULP SCREENS
WEIGHT AND CONSISTENCY REGULATORS
METERING SYSTEMS FLOAT VALVES



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The best for leather, rubber and cotton belting.
Potter's Patent—Every Hook Guaranteed
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1—783 HP Lasker Adams boiler, 200 lb. pressure.
1—1000 HP Stirling boiler, 275 lb. pressure.
2—Impco design, No. 2 pulp knotters.
2—311 HP Union Iron Works boilers, 200 lb. pressure.

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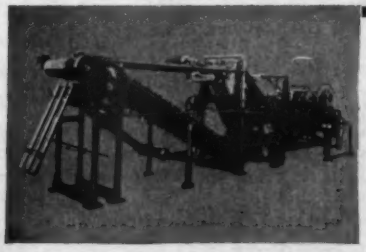

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Used with our large Heavy Duty Bottoming Machines, the pasted bottoms are under pressure while the paste sets—Bags are shingled for easy handling.

Write for information on Tubers and Bottomers for single or multiwall bags, also Patented Side Control.

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SOUTH WINDHAM • CONNECTICUT

CURRENT MARKET QUOTATIONS

RAGS (Domestic)
f. o. b. New York City

NEW RAGS — per cwt.

Blue Overalls	5.50 to 5.75
Corduroy	2.75 to 3.00
Cottons—	
Washables, No. 1	2.50 to 2.75
Fancy Percales	4.00 to 4.25
New Soft Blacks	3.50 to 3.75
New Light Seconds	2.25 to 2.50
New Dark Seconds	2.00 to 2.25
Khaki Cuttings—	
Mixed	2.50 to 2.75
O. D.	3.00 to 3.25
New White Canvas	8.00 to 8.50
New Mixed Blacks	2.75 to 3.00
Shirt Cuttings	
New White No. 1	7.75 to 8.00
Silesias No. 1	5.00 to 5.25
New Unbleached	7.75 to 8.00
Fancy	3.00 to 3.25
Linen Cuttings—	
White	13.00 to 13.50
Grey	12.50 to 13.00

RAGS (Domestic)
f. o. b. New York City

OLD RAGS

	per cwt.
Roofing—	
No. 1	1.80 to 1.85
No. 2	1.60 to 1.65
No. 3	1.50 to 1.55
Twos and Blues—	
Repacked	2.00 to 2.25
Thirds and Blues—	
Repacked	1.75 to 2.00
Miscellaneous	1.60 to 1.75
Whites, No. 1—	
Repacked	3.50 to 4.00
Miscellaneous	3.00 to 3.25
Whites, No. 2—	
Repacked	2.75 to 3.00
Miscellaneous	2.25 to 2.50

RAGS (Foreign)
ex dock New York City

NEW RAGS — per cwt.

New Dark Cuttings
New Mixed Cuttings
New Light Silesias
Light Flannelettes — Nominal
Unbleached Cuttings
New White Cuttings
New Light Oxfords
New Light Prints

RAGS (Foreign)
ex dock New York City

OLD RAGS — per cwt.

No. 1 White Linens
No. 2 White Linens
No. 3 White Linens
No. 4 White Linens
No. 1 White Cottons
No. 2 White Cottons
No. 3 White Cottons
No. 4 White Cottons
Extra Light Prints — Nominal
Ord. Light Prints
Med. Light Prints
Dutch Blue Cottons
French Blue Cottons
French Blue Linens
Checks and Blues
Linsey Garments
Dark Cottons
Old Shoppers

ROPE and BAGGING
f. o. b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	4.65 to 4.85
Wool Tares—	
Light	4.25 to 4.50
Heavy	4.50 to 4.75
No. 1 Scrap Bagging	4.25 to 4.50
Manila Rope—	
Foreign	6.00 to 6.50
Domestic	6.00 to 6.50
New Burlap Cuttings	5.00 to 5.25
Jute Threads—	
Foreign (Nom.)	6.25 to 6.75
Domestic	5.50 to 6.00
Strings—	
Sisal	3.25 to 3.50
Soft jute	4.25 to 4.50
Mixed	1.25 to 1.50

WASTE PAPER
Ceiling prices set by OPA f.o.b. cars at points of shipment East of Rocky Mountains.

	per cwt.
Shavings—	
White Envp. Cuttings	60.00-
Hard White No. 1	50.00-
Soft White No. 1	43.00-
Soft White, Extra	—
Fly Leaf	33.50-
Flat Stock—	
Stitchless	—
Overissue Mags	33.50-
Solid Flat Book	31.50-
Crumpled No. 1	—
Solid Ledger Books	—
Ledger Stock—	
White	42.50-
Colored	38.50-
New B. B. Chips	14.50-
Manilas—	
New Env. Cuts	54.00-
New Cuttings	37.00-
Sulphite Mill Wrappers	—
No. 1 Old Kraft	30.00-
Old Corrugated Boxes	16.50-
Old Kraft Corrugated Boxes	27.00-
New Kraft Cuttings 100%	52.00-
New Kraft Cor. Cuttings 100%	49.00-
News—	
No. 1 Wh. News Cuttings	33.00-
Strictly Overissue	17.00-
Strictly Folded	15.00-
Super Mixed Paper	14.00-
No. 1 Mixed Paper	13.00-

CHEMICALS
f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25-
Ground, cwt.	4.00-
Powdered, cwt.	4.40-
Blanc Fixe—	
Pulp, bulk, ton	35.00 to 42.00
Dry, barrels, pound	.0300 to .0400
Bleaching Powder—	
Drums, cwt.	2.00 to 3.00
Casein (Domestic Standard)—	
30-30 mesh (bags), lb.	28.00 to 29.00
80-100 mesh (bags), lb.	29.00 to 30.00
Argentine, lb.	29.00 to 30.00
China Clay—	
Domestic Filler	
Bulk (mine) ton	7.50 to 15.00
Domestic Coating	
Bulk (mine) ton	12.00 to 22.00
Imported (ship side)	
Bulk (lump) ton	15.00 to 26.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicia), lb.	.70 to .75
Glye. (C.P.) drums, lb.	19.50-
Litharge, powd., bbl., lb.	.08¼ to
Rosin (Gum)—	
New York, per 100 lbs.	
E	3.19-
F	3.19-
G	3.17-
WW	3.65-
Rosin (Wood), carlots	2.91-
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 17.00
Imp. bulks on dock—	
(Atl. ports) ton (Nom.)	20.00 to
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—Ammonia,	
Solid, drums, cwt.	2.30 -
Ground and flaks, drums, cwt.	2.70 -
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.85 to 2.00
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	3.10-
Pearl, barrels, cwt.	3.20-
Paper (Sp.) bags, cwt.	3.20-
barrels, cwt.	3.30-
Sulphur (crude)—	
(mine) bulk, long ton	18.00 to 20.50
Talc—	
Dom. 100 lb. bags (mine) ton	15.00 to 20.00
Imp. bulk, ton (Nom.)	—
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .06
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	.07¾ to .08

CHEMICAL PULP
(Air-dry ton)

	per cwt.
Soda (Dom.) del'd. mill—	
Bleached, contract	3.50 -
Open market	3.40 -
Sulphate (Dom.) f. o. b. mill—	
Bleached	4.25 to 4.50
Kraft No. 1	3.50 to 3.75
Kraft, Southern, del.	3.25 to 3.50
Sulphate (Imp.) on dock—	
Bleached	(nominal)
Kraft No. 1	(nominal)
Kraft No. 2	(nominal)
Sulphite (For.)	
On dock—	
Prime bleached	(nominal)
Prime easy bleach	(nominal)
Prime strong unbl.	(nominal)
Sulphite (Dom.)	
Bleached, contract	3.62½ -
Bleached, open market	3.85 -
Unbleached, contract	3.17½ -
Unbleached, open market	3.35 -

MECHANICAL PULP
(Air-dry ton)

	per ton
No. 1 Dom. & Can. (f. o. b. pulp mill)	31.00 to 34.00
No. 1 Imp. (On dock)—	
Moist	—
Dry	—

PAPER
f. o. b. New York City

	per ton
Boards—	
Bluders	84.00 to 88.00
Chip	45.00-
Chip, sgl. mla. lined	60.00-
Coated, white patent	
.016	80.00-
.020 and heavier	75.00-
Kraft liner	65.00-
News	45.00-

	per cwt.
Book (easel)	
No. 1 Coated	14.90-
No. 2 Coated	13.55-
No. 3 Coated	12.70-
No. 4 Coated	12.25-
No. 2 Offset	11.00-
A Grade Super	10.40-
B Grade Super	10.00-
Bonds (Rag Content)—	
100% Rag	
Ext. No. 1	42.50 to 46.00
100% Rag	40.25 to 46.00
85% Rag	
75% Rag	26.65 to 27.75
65% Rag	
50% Rag	20.15 to 22.00
25% Rag	17.55 to 19.25
Regular Colors	1.00 cwt. extra
Bonds (Sulphite)—	
No. 1	11.70-
No. 2	10.75-
No. 4	9.90-
Colors	1.00 cwt. extra
Glassine (f. o. b. mill)—	
Embossed (25 lb. up)	14.00 to 14.25
Bleached (25 lb. up)	12.75 to 13.00
Unbleach. (25 lb. up)	11.50 to 12.00
Greaseproof—	
Bleach. (25 lb. up)	10.75 to 11.25
Unbleach. (25 lb. up)	10.00 to 10.50
Ledgers (Rag Content)—	
100% Rag	
Ext. No. 1	40.25 to 47.25
100% Rag	35.00 to 37.75
85% Rag	29.90 to 35.00
75% Rag	26.90 to 29.00
65% Rag	21.65 to 26.25
50% Rag	21.45 to 23.50
25% Rag	18.20 to 20.00
Regular Colors	1.00 cwt. extra
Ledgers (Sulphite)—	
No. 1	13.00-
No. 2	12.05-
No. 4	8.80-
News—	
Rolls (Contract)	50.00-
Rolls (Spot)	(nominal)
Sheets	58.00 -
Tissues (Carlots)—	
White, No. 1	.97½ -
White, No. 2	.75 to .77½
Anti-Tarnish M. G.	.90 to 1.05
Colored	1.00 to 1.10
Kraft	.85 to .90
Manila	.80 to .85
Napkins, semi-crepe (12¼ lb. to M shts.) per cs	.46 -
Napkins, full crepe and emb'sed (12¼ lb. to M shts.) per cs.	.50 -
Toilet, Bleached (M shts.) per cs	5.80 -
Toilet, Unbleached (M shts.) per cs	3.50 -
Towels—	per case
Bleached	3.10 to 3.65
Unbleached	1.95 to 3.30
Wrappings (Kraft)—	
Extra Quality	6.00 to 6.50
Super-Standard	5.00 to 5.50
Northern Standard	4.50 to 5.00
Southern Standard	4.50 to 5.00
Wrappings (Sulphite and Bleached Kraft)— (Rolls, f. o. b. mill)	
Bleached papers—	
M.F.& M.G. Waxing, 30 lb. (Carloads only)	7.25 to 7.50
(10,000 lbs.)	7.50 to 7.75
Drug wrapp. 35 lb.	6.75 to 7.00
Unbleached Papers—	
Com. Grd. Buteh. 40 lb.	5.25 to 5.50
No. 1 Butchers	5.50 to 5.75
No. 1 Imit. Parch & Dry Fin.Groe.Sulphite 30 lb.	6.25 to 6.50
No. 2 Imit. Parch & Dry Fin.Groe.Sulphite 30 lb.	6.00 to 6.25
Steam Finish, 50 lb.	4.75 to 5.00
Water Finish, 40 lb.	5.25 to 5.50
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	6.00 to 6.25
Envp. Mla., Sub. 16-28 (No. 2)	5.75 to 6.00
Envp. Mla. (Prices based on large sheets untrim'd reamarked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	6.00 to 6.25
No. 2	5.75 to 6.00
M. G. Sulphite and Kraft (other than Waxing)	
Grade A-35 lb.	6.50 to 6.75
Grade B-35 lb.	6.25 to 6.50